

ORDER NO. MKE0101003C1

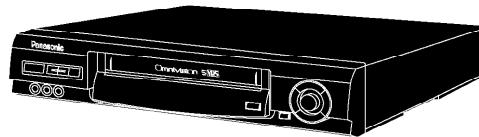
B3

Service Manual

Video Cassette Recorder

Omnivision S VHS

PV-VS4821 / PV-VS4821-K



SPECIFICATIONS

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Power	Source: 120 V AC $\pm$ 12 V AC, 60 Hz $\pm$ 3 Hz	Audio	Wow and Flutter: Normal Mono: SP: Less than 0.2 % WRMS LP: Less than 0.3 % WRMS SLP: Less than 0.4 % WRMS
	Consumption: Approx. 28 W (power on), Approx. 3.7 W (power off)		Hi-Fi Stereo: Less than 0.015 % WRMS
Video	Head: 4 rotary heads helical scanning system	RF Out	CH 3/CH 4 switchable 72 dB μ (open voltage) 75 Ω unbalanced
	Input / Output Level: (Composite): VIDEO IN/OUTPUT Jack (Phono type) 1.0 Vp-p 75 Ω unbalanced (Component): S-VIDEO CONNECTOR (DIN Type 4 pin) Luminance 1.0 Vp-p 75 Ω unbalanced Chrominance 0.63 Vp-p 75 Ω unbalanced Cyanogen (Standard NTSC Color Bar) Burst 0.286 Vp-p, 75 Ω unbalanced	Tuner	Broadcast Channels: VHF 2-13, UHF 14-69 CABLE Channels: Midband A through I (14-22) Superband J through W (23-36) Hyperband AA-EEE (37-64) Lowband A-6-A-1 (95-99) Special CABLE channel 5A (01) Ultraband 66-94, 100-125
	Signal-to-Noise Ratio: VHS Mode: SP: more than 43 dB LP/SLP: more than 41 dB S-VHS Mode: SP: more than 44 dB SLP: more than 42 dB		Video Signal
	Horizontal Resolution: Color/Monochrome: VHS Mode: more than 230 lines S-VHS Mode: more than 400 lines	Tape Speed	SP: 1-5/16 i.p.s (33.35 mm/s), LP: 21/32 i.p.s (16.67 mm/s), SLP: 7/16 i.p.s (11.12 mm/s) Record/Playback Time: 8 hr. with 160 min. type tape used in SLP mode FF/REW Time: Less than 1-1/6 min. (120 min. type tape) *Note: FF/REW Time may exceed specification according to tape condition.
	Head: Normal Mono: 1 stationary head Hi-Fi Stereo: 2 rotary heads		Tape Format
Audio	Input Level: AUDIO IN Jack (Phono type) -10 dBv 50 k Ω unbalanced Output Level: AUDIO OUT Jack (Phono type) -8 dBv 1 k Ω unbalanced	Operating Condition	5 $^{\circ}$ C-40 $^{\circ}$ C (41 $^{\circ}$ F-104 $^{\circ}$ F) (Temperature) 10 %-75 % (Humidity)
	Frequency Response: Normal Mono: SP: 100 Hz-8 kHz LP: 100 Hz-6 kHz SLP: 100 Hz-5 kHz Hi-Fi Stereo: SP/LP/SLP: 20 Hz-20 kHz	Dimension (W x H x D)	430 mm X 98 mm X 242 mm (16-15/16 inch X 3-7/8 inch X 9-9/16 inch)
	Signal-to-Noise Ratio: Normal Mono: SP: more than 42 dB LP/SLP: more than 40 dB Hi-Fi Stereo: SP/LP/SLP: more than 60 dB	Weight	3.5 kg (7.7 lbs.)

Weight and dimensions shown are approximate.
Designs and specifications are subject to change without notice.

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WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

1. SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Layout, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

2. An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing.
3. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
4. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
5. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

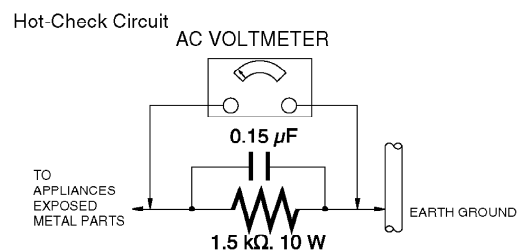
1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the

equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1 M Ω and 5.2 M Ω . When the exposed metal does not have a return path to the chassis, the reading must be infinity.

LEAKAGE CURRENT HOT CHECK (See figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5 k Ω , 10 W resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground, as shown in figure 1.
3. Use an AC voltmeter, with 1 k Ω /V or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 V RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks. Leakage current must not exceed 1/2 mA. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Figure 1



2. PREVENTION OF ELECTRO-STATIC DISCHARGE (ESD) TO ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such

components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits, some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

- 1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should remove electrostatic charge for potential shock reasons prior to applying power to the unit under test.**
- 2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.**
- 3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.**
- 4. Use only an antistatic solder removal device. Some solder removal devices not classified as "antistatic (ESD protected)" can generate electrical charge sufficient to damage ES devices.**
- 5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.**
- 6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).**
- 7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.**
CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
- 8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a**

carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

"NOTE to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-22 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical."

3. OPERATION GUIDE

4. SERVICE NOTES (PLEASE READ)

4.1. SERVICE NOTES

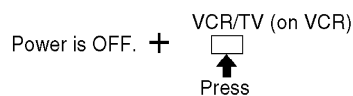
4.1.1. SIMPLIFIED FAULT FINDING DATA

Simplified Self-Diagnostic System facilitates finding the cause of the fault. A 4 digit fault code will be displayed in F.I.P.

The Simplified Fault finding data is stored in the Memory IC (IC6005). This data is cleared after it is displayed, and then the POWER button is pressed back on.

1. With power turned off, press VCR/TV button on VCR (for over 3 seconds if VCR is not in shut off condition).

Fig. 1-1



2. Fault code (4 digit number) will be displayed in F.I.P. as shown.

Fig. 1-2

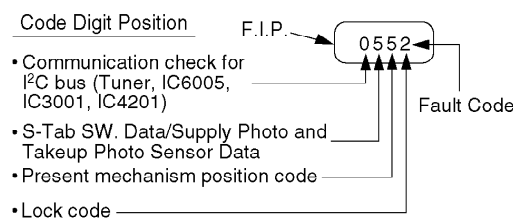


Fig. 1-3

Explanation of Codes	Code No.			
Communication check for I ² C bus (Tuner, IC6005, IC3001, IC4201) (Refer to Fig. 1-4.)	0 1 F			
S-Tab SW. Data/Supply Photo and Takeup Photo Sensor Data (Refer to Fig. 1-5.)	1 2 8			
Present Mechanism Position Code Mechanism Position is indicated. (Refer to Fig. 1-6.)			1 2 3 4 5 6 7 8 9 A B C D	
Lock Code (See Note) • VCR is not in shut-off condition. • Reel lock. • Cylinder lock. • Exceeds loading/unloading time. (Mechanism Lock) • Exceeds Cassette loading/unloading time. (Cassette Lock) Tape Unloading (direction) Tape Loading (direction)			0 1 2 3 1 2	 4 4

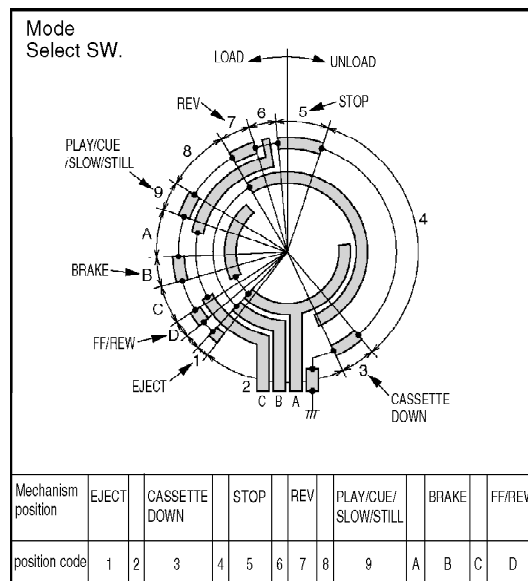
Fig. 1-4

Communication check for I ² C bus (IC6001 ↔ Tuner)	Communication check for I ² C bus (IC6001 ↔ IC6005)	Communication check for I ² C bus (IC6001 ↔ IC3001)	Communication check for I ² C bus (IC6001 ↔ IC4201)	Code No.
OK	OK	OK	OK	0
			NG	1
		NG	OK	2
			NG	3
	NG	OK	OK	4
			NG	5
		NG	OK	6
			NG	7
NG	OK	OK	OK	8
			NG	9
		NG	OK	A
			NG	b
	NG	OK	OK	C
			NG	d
		NG	OK	E
			NG	F

Fig. 1-5

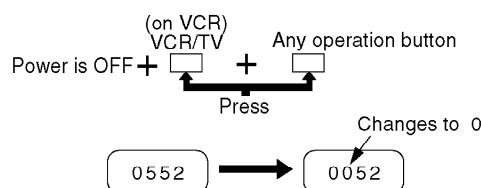
S-Tab SW. condition	Supply Photo Sensor condition	Takeup Photo Sensor condition	Code No.
ON	OFF	OFF	1
	ON	OFF	2
	OFF	ON	3
	ON	ON	4
OFF	OFF	OFF	5
	ON	OFF	6
	OFF	ON	7
	ON	ON	8

Fig. 1-6



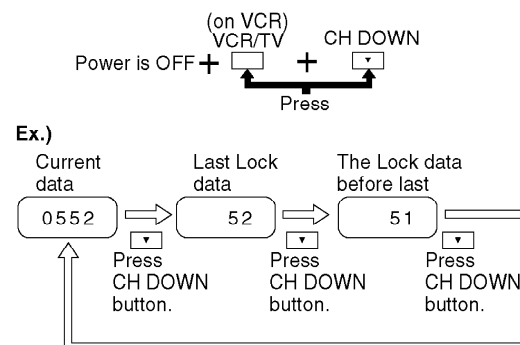
3. While pressing VCR/TV button on VCR with power turned off, press any operation button on either VCR, or remote to detect that a key has been pressed.
The 1st digit changes to "0" only when key is detected.

Fig. 1-7



4. When 1 to 4 listed in Lock code occurs, Lock data will be stored in the EEPROM IC (Current data, Last Lock data, and the Last Lock data before last). Lock data displayed in F.I.P. can be changed by pressing CH DOWN button.

Fig. 1-8



Note:

1. Lock data will be kept after the AC Cord is unplugged.
2. When 1 to 4 listed in Lock code occurs for the first time, the VCR does not go into VCR shut-off condition. If it occurs again within a minute, the VCR goes into VCR shut-off condition. Then, the VCR stops and all VCR function buttons except for power become non-operational.

4.1.2. USAGE SCREEN MODE

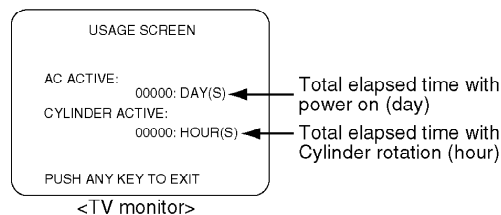
Function displayed on the TV monitor:

- the total elapsed "Power on" time (in days)
- the total elapsed "Cylinder rotation" time (in hours)

1. With power turned on and no cassette, press VCR/TV button on VCR and 7 key on remote together.

The USAGE SCREEN will be displayed on the TV Monitor.

Fig. 3



Note:

1. After replacing the Cylinder Unit, press COUNTER RESET button on remote in this mode. Only Total elapsed "Cylinder rotation" time (in hours) will be cleared to 0.
2. To release from Usage Screen Mode, press any operation button on VCR or insert a cassette tape in this mode. The VCR will return to normal operation mode.

4.1.3. EEPROM IC (IC6005), MAIN C.B.A. REPLACEMENT NOTE

After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.

4.1.4. SERVICE POSITION

4.1.4.1. Service Position

Service Position	Purpose
Service Position (1)	Mechanism check Mechanical adjustment Electrical adjustment
Service Position (2)	Main C.B.A. check

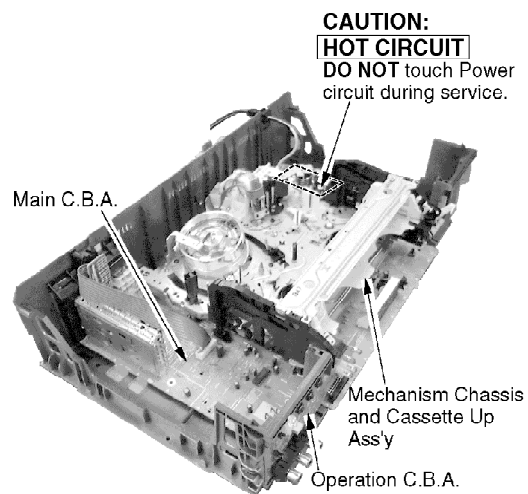
CAUTION:

HOT CIRCUIT (Primary circuit) exists on the Main C.B.A.

Use extreme care to prevent accidental shock when servicing.

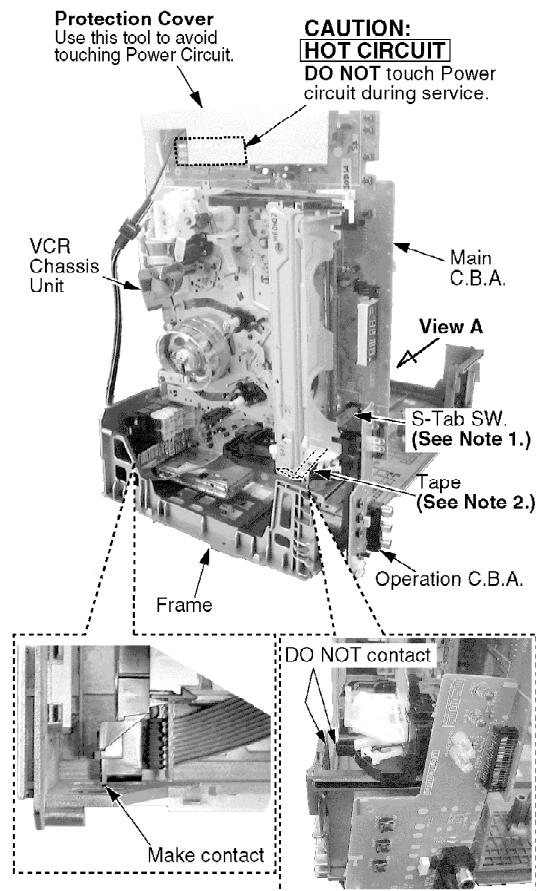
4.1.4.1.1. Service Position (1)

Fig. 4-1



4.1.4.1.2. Service Position (2)

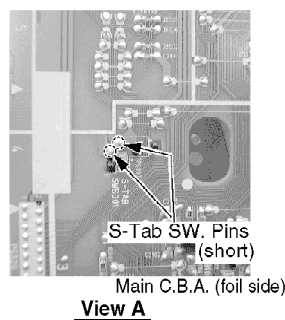
Fig. 4-2



Note:

1. It is possible that the S-Tab SW. may not work correctly in Service Position (2). (Recording can not be done). In this case, short the S-Tab SW. Pins on the foil side of the Main C.B.A. to turn this SW. on.

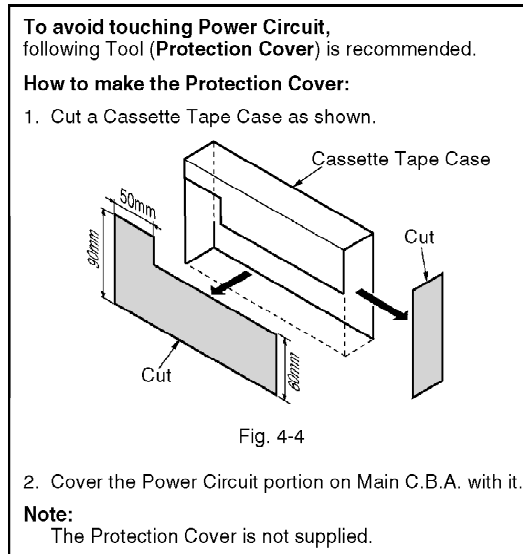
Fig. 4-3



Alternative method:
Cover the S-Tab SW. with masking tape.

2. Place the tape between the Cassette Up Ass'y and Main C.B.A. to get a stability.
3. When disassembling/assembling, refer to "**CABINET SECTION**" in

DISASSEMBLY/ASSEMBLY PROCEDURES.



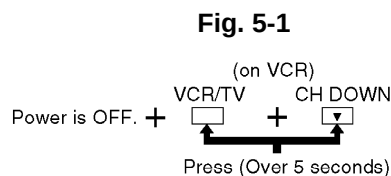
4.1.5. HOT CIRCUIT

Primary circuit exists on the Main C.B.A.

This circuit is identified as "HOT" on the C.B.A. and in the Service Manual. Use extreme care to prevent accidental shock when servicing.

4.1.6. SERVICE MODE

In order to inhibit detection of the Supply & Takeup Photo Transistors, Reel Sensor, and Cylinder Lock, press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.



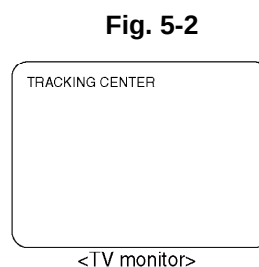
The power comes on and the unit goes into service mode.

In this mode, Mechanism movement can be confirmed. When removing Cassette Up Ass'y, it can be confirmed without a cassette.

To release from this mode, press POWER button off or disconnect AC Plug.

4.1.7. TRACKING CENTER MODE (TRACKING FIX AT CENTER)

Insert the Cassette tape. Set the unit into Service Mode. Play back the Cassette tape. Press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor. In this mode, the tracking is fixed at center. (Auto tracking and manual tracking functions are not operational.)



To release from this mode, press PLAY or STOP button.

4.1.8. CAUTION FOR INSTALLATION OF FRONT PANEL ASS'Y

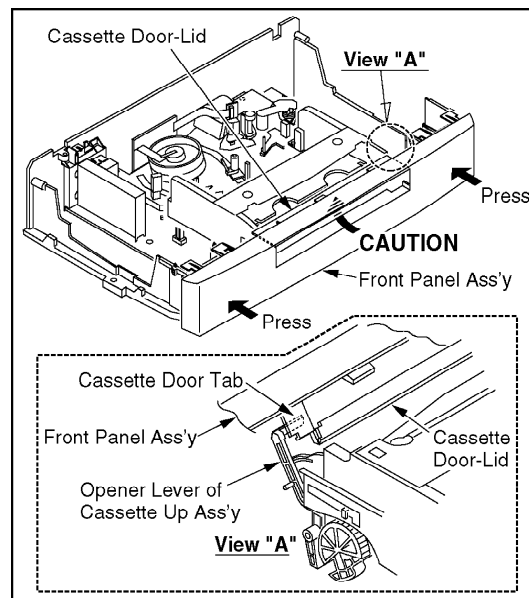
CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

Install the Front Panel Ass'y as follows:

1. Swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.
2. Make sure that all locking tabs are aligned properly. Then, press the Front Panel straight in.

Fig. 6



4.1.9. METHOD FOR LOADING/UNLOADING OF MECHANISM

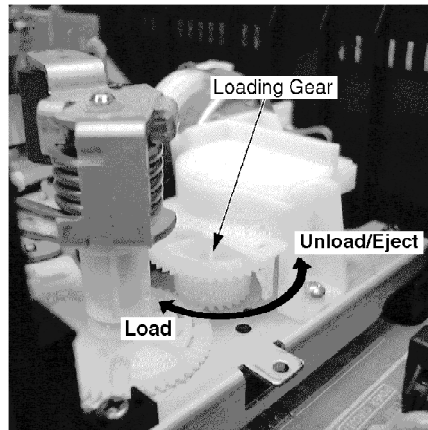
4.1.9.1. (Manual Method)

Turn the Loading Gear clockwise (for loading) or counterclockwise (for unloading) using needlenose pliers etc.

Note:

Do not use this method if Mechanism is jammed or locked.

Fig. 7-1



4.1.9.2. (Electrical Method)

Apply +10.0 V DC Power Supply to the Loading Motor terminals.

Loading

DC + to Portion "a," DC - to Portion "b"

Unloading

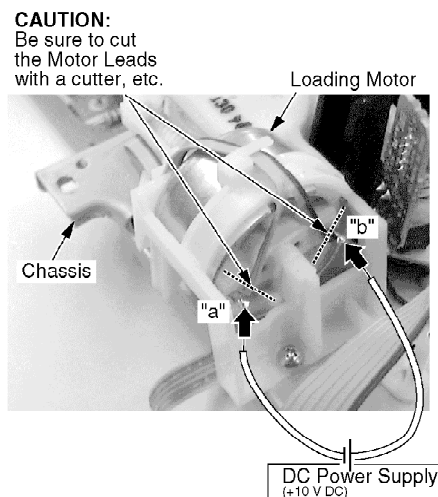
DC - to Portion "a," DC + to Portion "b"

CAUTION:

Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.

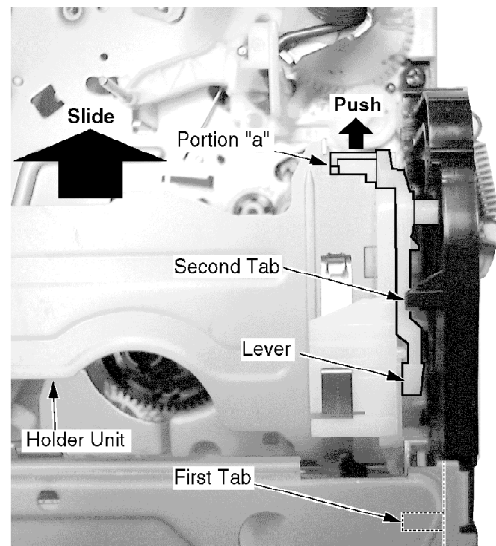
Otherwise, the Loading Motor Drive IC (IC2501) may be damaged. When reconnecting the Motor Leads, solder at below / 320 °C for less than 3 seconds.

Fig. 7-2



When loading without a cassette, push Portion "a" on the Holder Unit of Cassette Up Ass'y so that the Lever clear the First Tab and Second Tab.

Fig. 7-3



4.1.10. HOW TO REMOVE A JAMMED TAPE

CAUTION:

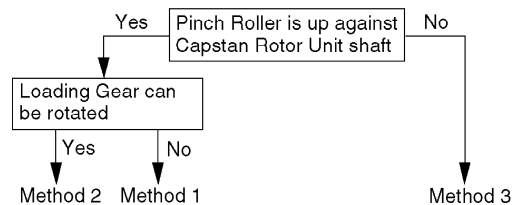
Wiper Arm Unit may be damaged or its spring may be out of place when the jammed tape is removed by force.

Remove a jammed tape as follows:

4.1.10.1. Manual Method

When a tape jam is encountered, check the tape loading condition and use the following procedure to remove a tape jam.

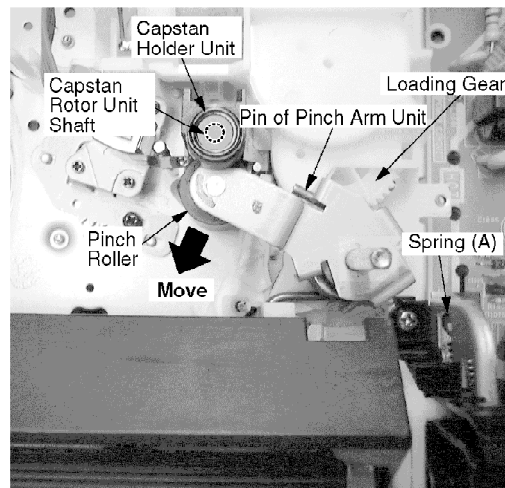
Fig. 8-1



Method -1:

- 1. Move the Pinch Roller Unit out by unhooking the Pin of Pinch Arm Unit so that the Pinch Roller is separated from the Capstan Rotor Unit shaft.**

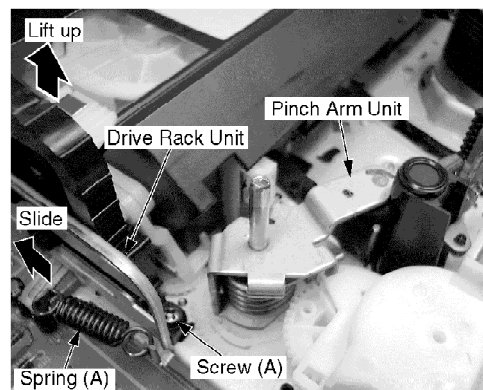
Fig. 8-2



Top View

2. Remove the tape from the tape path.
3. Rewind the tape into the cassette by rotating the Center Clutch Unit counterclockwise.
4. Unhook Spring (A) of the Drive Rack Arm.
5. Remove Screw (A).
6. Lift the Cassette Up Ass'y. While pulling the Cassette Up Ass'y out far enough so that it clears the Drive Rack Arm, slide the Drive Rack Unit as indicated by the arrow to remove the cassette tape from the Cassette Up Ass'y.
7. Check the cause of mechanical trouble and repair.

Fig. 8-3



Method -2:

1. Rotate Loading Motor counterclockwise with needlenose pliers, etc. so that the Pinch Roller is separated from the shaft of the Capstan Rotor Unit.

2. Perform Step 2 through Step 7 of Method -1.

Method -3:

1. Perform Step 2 through Step 7 of Method -1.

Note:

After repairing mechanical trouble, make sure that all gear alignments are correct, especially the Wiper Arm Unit and Drive Rack Unit of Cassette Up Ass'y. (Refer to "EJECT Position Confirmation**" in DISASSEMBLY/ASSEMBLY PROCEDURES.)**

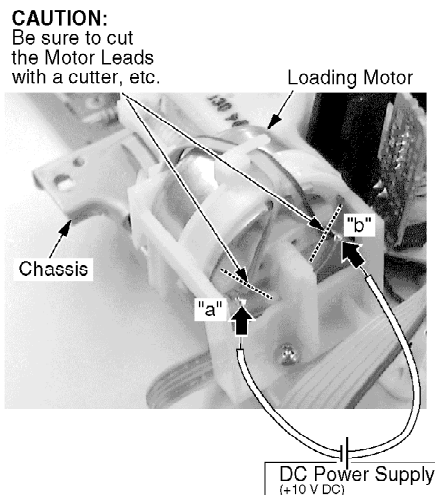
4.1.10.2. Electrical Method

Electrical method can only be performed when the mechanism is moved by rotating the Loading Gear.

CAUTION:

- 1. Before applying DC Power Supply, be sure to cut the Motor Leads with a cutter, etc.
Otherwise, the Loading Motor Drive IC (IC2501) may be damaged.
When reconnecting the Motor Leads, solder at below / 320 °C for less than 3 seconds.**
- 2. If loading does not start in approx. 2 seconds after DC Power Supply is applied, DO NOT continue to apply DC Power Supply.
Instead, perform "Manual Method."**
- 1. Be sure to cut the Motor Leads with a cutter, etc.**
- 2. Apply +10.0 V DC Power Supply to the Loading Motor terminals.**
- 3. When the Loading Posts reach the fully unloaded position, remove the Power Supply.**

Fig. 9



4. Rewind the tape into the cassette by turning the Center Clutch Unit counterclockwise.

5. Eject the cassette by applying +10.0 V DC Power Supply again.

4.1.11. BLACK SCREWS ON THE CHASSIS

Black Screws are used on the Mechanism Chassis to identify screws that require adjustment.

4.1.12. HOW TO RESET ALL VCR MEMORY FUNCTIONS

To reset (clear) the select language, channel auto set and set clock functions to their initial power on condition (power on, no cassette inserted), hold down the PLAY and CH UP buttons on the unit together for more than 5 seconds.

Power will shut off.

4.1.13. HOW TO CONFIRM AUTO CLOCK SET FEATURE

- 1. Connect an RF cable from the output of one unit to the input of the test unit.**
- 2. Select corresponding RF channels.**
- 3. Playback a recording of P.B.S. channel including clock set data and confirm this feature.**

4.1.14. VARIABLE VOLTAGE ISOLATION TRANSFORMER

An Isolation Transformer should always be used during the servicing of VCR whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect VCR from being damaged by accidental shorting that may occur during servicing. Also, when troubleshooting the above type of Power Supply Circuit, a variable isolation transformer is required in order to increase the input voltage slowly.

4.1.15. SPECIAL NOTE

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the

"ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

4.1.16. REPLACEMENT PROCEDURE FOR LEADLESS (CHIP) COMPONENTS

The following procedures are recommended for the replacement of the leadless components used in this unit.

1. Preparation for replacement

A. Soldering Iron

Use a pencil-type soldering iron that uses less than 30 watts.

B. Solder

Eutectic Solder (Tin 63 %, Lead 37 %) is recommended.

C. Soldering time

Do not apply heat for more than 4 seconds.

D. Preheating

Leadless capacitor must be preheated before installation. - (266 °F ~ 302 °F)

(130 °C ~150 °C) for about 2 minutes.

Note:

A. Leadless components must not be reused after removal.

B. Excessive mechanical stress and rubbing of the component electrode must be avoided.

2. Removing the leadless component

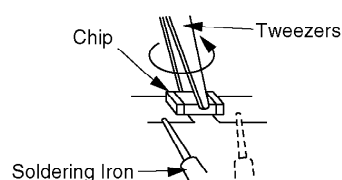
Grasp the leadless component body with tweezers and alternately apply heat to both electrodes. When the solder on both electrodes is melted, remove the leadless component with a twisting motion.

Note:

A. Do not attempt to lift the component off the board until the component is completely disconnected from the board by a twisting action.

B. Be careful not to break the copper foil on the printed circuit board.

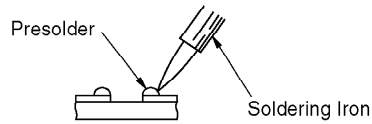
Fig. 10-1



3. Installing the leadless component

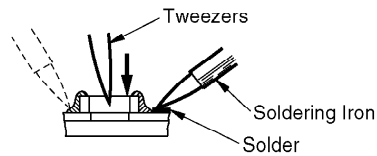
A. Presolder the contact points on the circuit board.

Fig. 10-2



B. Press the part downward with tweezers and solder both electrodes as shown below.

Fig. 10-3



Note:

Do not glue the replacement leadless component to the circuit board.

4.1.17. MODEL NO. IDENTIFICATION MARK

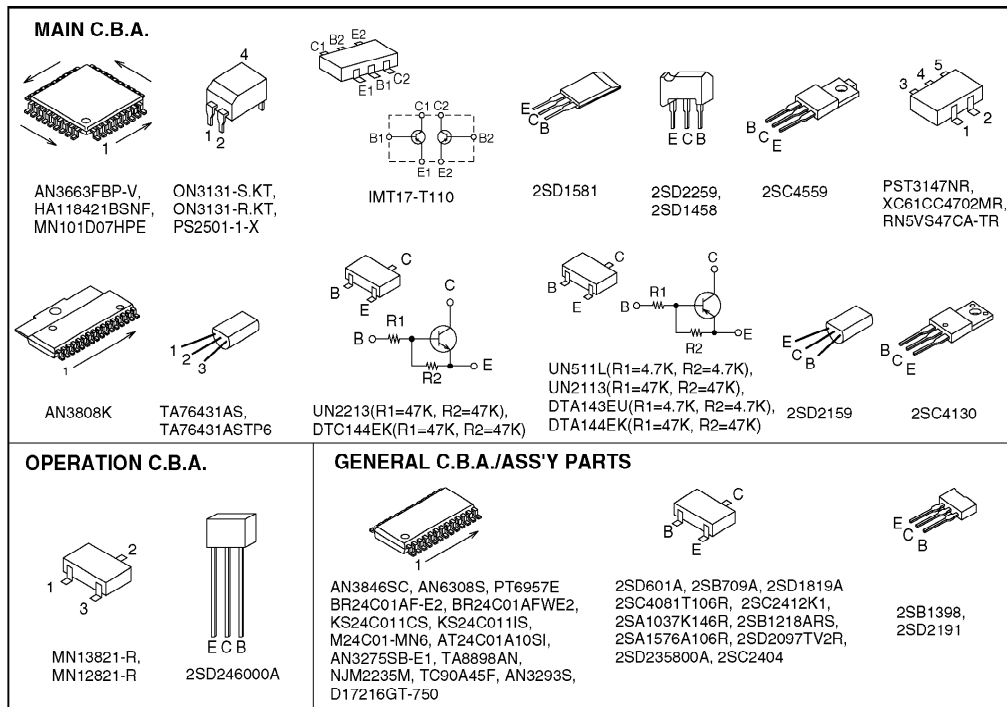
Use Marks shown in the chart below to distinguish the different models included in this Service Manual.

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B
Not Used	Z

Note:

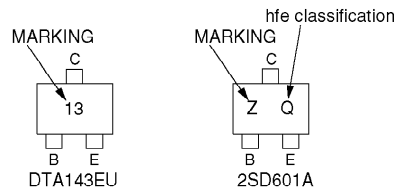
Refer to Item 3 of Schematic Diagram Notes of Schematic Diagram and Circuit Board Layout Notes, for mark "Z."

4.2. IC, TRANSISTOR AND CHIP PART INFORMATION

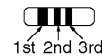


HOW TO READ THE IDENTIFICATION MARK OF CHIP COMPONENTS.

MARKING	PART NO.	MARKING	PART NO.
B	2SB709A	F	2SA1576A106R
B	2SC4081T106R	Z	2SD1819A
B	2SB1218ARS	Z	2SD601A
B	2SC2412K1	13	DTA143EU
F	2SA1037K146R		



HOW TO READ THE VALUES OF THE CYLINDRICAL TYPE CHIP COMPONENTS.



The widest color band must be read first for value.

1. RESISTOR

There are two types (ERD10LLJ... and ERD10TLJ...) of chip parts.

- 1) ERD10LLJ: Refer to above type.
- 2) ERD10TLJ : The narrow color band must be read first for value.

If this part is included in the parts list, be sure that the color band is read properly when servicing.

2. CAPACITOR

Because of the width of the color bands, the reading direction cannot be specified. However, the color band can be read on either side. Be sure to confirm the value using the schematic diagram.

CAUTION :

Once chip parts are removed, they must not be reused.
Always use a new part when installing a chip part.

5. DISASSEMBLY/ASSEMBLY PROCEDURES

5.1. CABINET SECTION

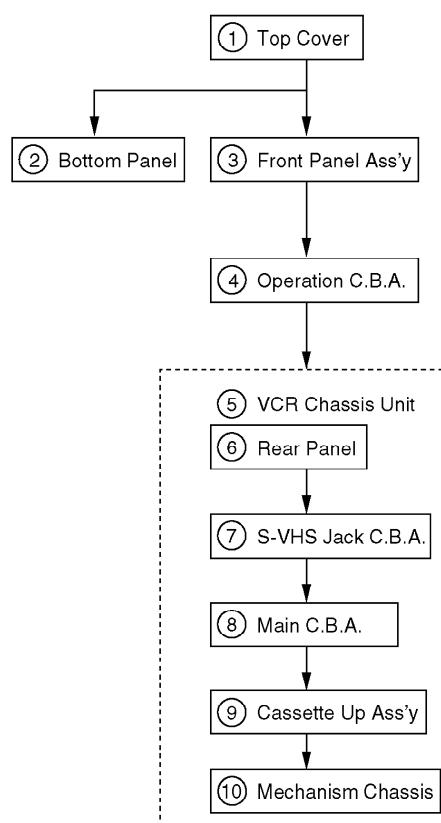
5.1.1. Disassembly Flowchart

Perform all disassembly procedures in the order described in the "Disassembly Flowchart" shown below. When reassembling, use the reverse procedure.

CAUTION:

Disconnect AC plug before disassembly.

Fig. D1



5.1.2. Disassembly Method

STEP /LOC. No.	PART	Fig. No.	REMOVE	Note
①	Top Cover	D2	(S-1), (S-2), 2(S-3)	1
②	Bottom Panel	D2	2(S-4), (S-5), 2(L-1)	---
③	Front Panel Ass'y	D2	4(L-2), 3(L-3)	2
④	Operation C.B.A.	D2	2(L-4), P6302	---
⑤	VCR Chassis Unit	D2	2(S-6), 2(S-7), Chassis Angle, (L-5)	3
⑥	Rear Panel	D2	P3150, 3(L-6)	---
⑦	S-VHS Jack C.B.A.	D2	3(S-8)	---
⑧	Main C.B.A.	D2	(S-9), P3551, P4001, P4002, P6201, P6202, Shield Plate	4
⑨	Cassette Up Ass'y	D2	(S-10), 2(S-11), (L-7), (P-1)	5
⑩	Mechanism Chassis	D2	-----	---

↑ A ↑ B ↑ C ↑ D ↑ E

How to read chart shown above:

A: Order of Procedure steps.

When reassembling, perform steps(s) in reverse order.

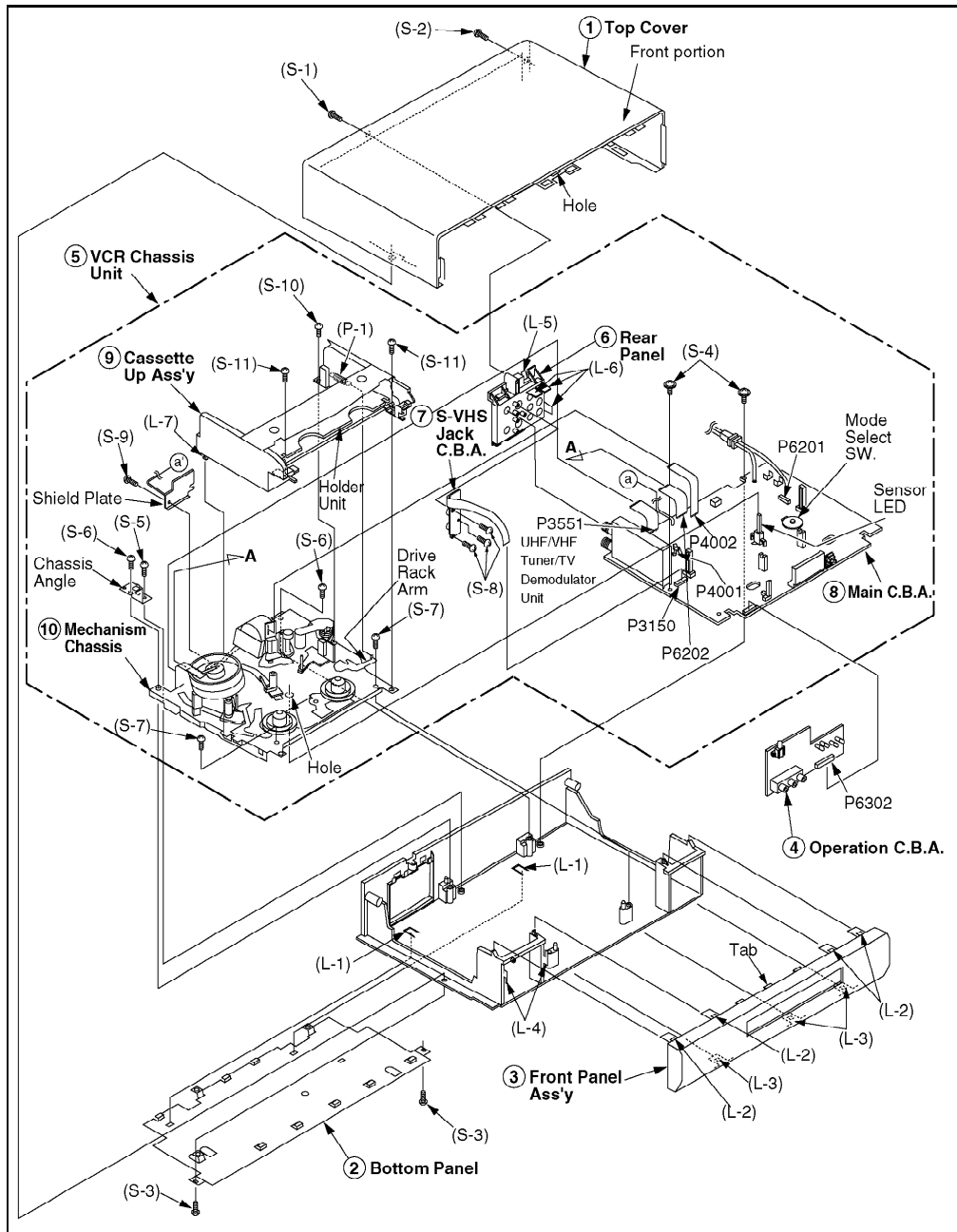
These numbers are also used as the identification (location) No. of parts in Figures.

B: Part to be removed or installed.

C: Fig. No. showing Procedure or Part Location.

D: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.
 2(S-1) = 2 Screws (S-1), 2(L-1) = 2 Locking Tabs (L-1),
 (P-1) = Spring (P-1)
 E: Refer to "**Notes in chart.**"

Fig. D2



5.1.2.1. Notes in chart

1. Installation of Top Cover

Install the Top Cover front portion at a downward angle so that the tab on the Front Panel Ass'y fits into the hole in the Top Cover. Then, lower the rear portion into place and tighten Screws (S-1), (S

-2) and 2(S-3).

2. Installation of Front Panel Ass'y

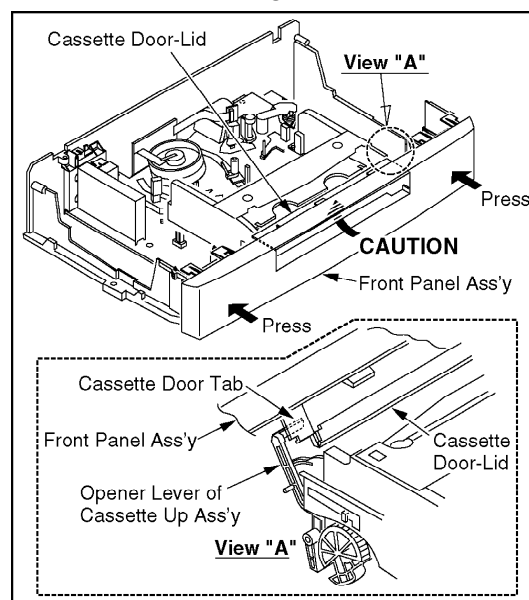
CAUTION:

Opener Lever may be damaged when Front Panel Ass'y is installed, with Cassette Door-Lid of Front Panel Ass'y and Opener Lever of Cassette Up Ass'y set incorrectly.

A. When installing the Front Panel Ass'y, swing the Cassette Door-Lid all the way open until the Cassette Door tab clears the Opener Lever.

B. Make sure that all locking tabs are aligned properly.
Then, press the Front Panel straight in.

Fig. D3



3. Installation of VCR Chassis Unit

When installing 2 Screws (S-7), slide the Holder Unit of the Cassette Up Ass'y (Refer to "**METHOD FOR LOADING/UNLOADING OF MECHANISM**" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.

Make sure that Mechanism and Cassette Up Ass'y are in the EJECT Position. (Refer to "**EJECT Position Confirmation**" in DISASSEMBLY/ASSEMBLY PROCEDURES.)

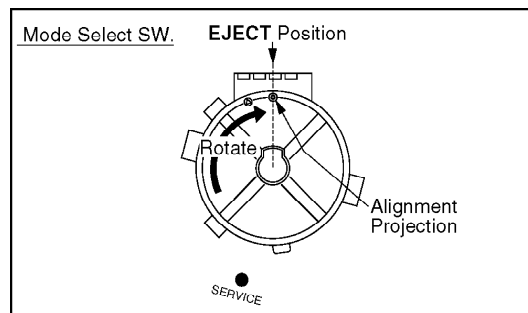
4. Installation of Mechanism Chassis and Cassette Up Ass'y onto Main C.B.A.

A. Make sure the Mode Select SW. on the Main C.B.A. is in EJECT

position. If not, rotate the Mode Select SW. until the alignment projection is in the EJECT Position.

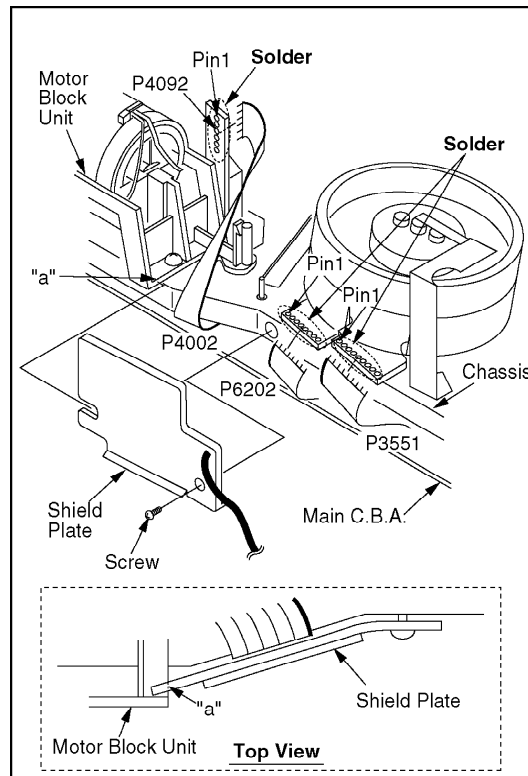
- B. Make sure the Mechanism and Cassette Up Ass'y are in the EJECT Position. (Refer to "EJECT Position Confirmation" in DISASSEMBLY/ASSEMBLY PROCEDURES.)**

Fig. D4



- C. Install the Mechanism Chassis and Cassette Up Ass'y straight onto the Main C.B.A. so that the Sensor LED clears the hole in the Mechanism Chassis and that 2 Connectors (P4001, P6201) are aligned and seated securely.**
- D. Connect the Flat Flexible Cables from P3551, P4002 and P6202 on the Main C.B.A. by soldering at below 320°C for less than 3 seconds as shown.**
- Install the Shield Plate as shown.**

Fig. D5



5. Installation of Cassette Up Ass'y

- A. Confirm that the Locking Tab (L-7) under the Cassette Up Ass'y is in Hole on the Mechanism Chassis when installing the Cassette Up Ass'y. Then, slide the Cassette Up Ass'y towards the back.
- B. When installing 2 Screws (S-11), slide the Holder Unit (Refer to "METHOD FOR LOADING/UNLOADING OF MECHANISM" in Service Notes) to tighten screws. Then, slide it back to the EJECT Position.
- C. Hook Spring (P-1) to the Drive Rack Arm on the Mechanism Chassis.

5.2. MECHANISM SECTION

5.2.1. Disassembly/Reassembly Method

This procedure starts with the condition that the cabinet parts and Main C.B.A. have been removed.
When reassembling, perform the step(s) in the reverse order.

Perform all disassembly/reassembly and alignments procedures in EJECT Position.

Step/ Loc. No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	-----	Grounding Plate Unit	J2-1	(S-1)	Adjustment
②	-----	Full Erase Head	J2-1	(L-1)	
③	1	Cylinder Unit	J2 1	3(S-3)	TAPE INTERCHANGEABILITY Adjustment
④	-----	Capstan Belt	J3-1	-	
⑤	-----	Support Angle	J3-1	(S-4), (S-5)	
⑥	5	Intermediate Gear B	J3-1	(L-2)	Gear Alignment
⑦	4,5,6	Main Cam Gear	J3-1	Main Cam Push Nut	Gear Alignment
⑧	4	Center Clutch Unit	J4-1	(W-1)	
⑨	4,8	Changing Gear Spring	J4-1	-	
⑩	4,8,9	Changing Gear	J4-1	-	
⑪	4,8,9,10	Idler Arm Unit	J4-1	-	
⑫	-----	Reel Gear	J5-1	2(L-3)	
⑬	4,5,6,7,8,9,10	Main Rod	J5-1	(W-2), (L-4)	Gear Alignment
⑭	-----	Stopper Angle	J6-1	(S-6)	
⑮	4,5,14	Capstan Rotor Unit	J6-1	-	
⑯	4,5,14,15	Oil Seal	J6-1	-	
⑰	4,5,14,15	Capstan Stator C.B.A.	J6-1	P2503, 2(S-7)	
⑱	-----	MR Head	J6-1	(S-8), Unsolder	MR HEAD GAP Adjustment
⑲	4,8,9,10,13	T Loading Arm Unit	J7-1	-	Gear Alignment
⑳	4,5,6,7,8,9,10,13,19	S Loading Arm Unit	J7-1	-	Gear Alignment
㉑	-----	T Brake Unit	J8-1	-	
㉒	-----	Tension Control Arm Unit	J8-1	3(L-5)	
㉓	21	T Reel Table	J8-1	-	
㉔	22	S Reel Table	J8-1	-	
㉕	22	Tension Arm Unit	J8-1	2(L-6), (P-1), (P-2)	
㉖	22,25	Loading Post Base-I Unit	J9	-	P2 AND P3 POST HEIGHT, TAPE INTERCHANGEABILITY Adjustment
㉗	22,25	Loading Post Base-S Unit	J9	-	
㉘	-----	Opener Piece	J10-1	2(L-7)	
㉙	4,5,6,7	Drive Rack Arm	J10-1	-	
㉚	28	Pinch Arm Unit	J10-1	-	
㉛	28,30	P5 Arm Unit	J10-1	-	
㉜	5,6,28	Intermediate Gear A	J10-1	-	Gear Alignment
㉝	-----	Motor Block Unit	J11	2(S-9)	
㉞	-----	Audio Control Head Unit	J11	(S-10)	TAPE INTERCHANGEABILITY Adjustment
㉟	5,6,28,30,32,33	Lift Gear	J11	-	
㊱	4,5,14,15,33	Capstan Holder Unit	J11	3(S-11)	
㊲	22,25	Tension Arm Boss	J11	(L-8)	
㊳	4	SS Brake Arm Unit	J5-1	(L-9), (P-3)	
㊴	4,5,14,15,17	Sub Rotor Unit	J6-1	-	
㊵	-----	Regulator Angle	J8-1	(S-12)	
㊶	-----	S-VHS Detect Piece	J3-1	2(L-10)	

How to read chart shown above:

A: Order of Procedure steps.

When reassembling, perform steps(s) in reverse order.

These numbers are also used as the identification (location) No. of parts in Figures.

B: Steps to be completed prior to the current step.

C: Part to be removed or installed.

D: Fig. No. showing Procedure or Part Location.

E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.

(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1),

(W-1) = Washer (W-1), (P-1) = Spring (P-1),

(C-1) = Cut Washer (C-1)

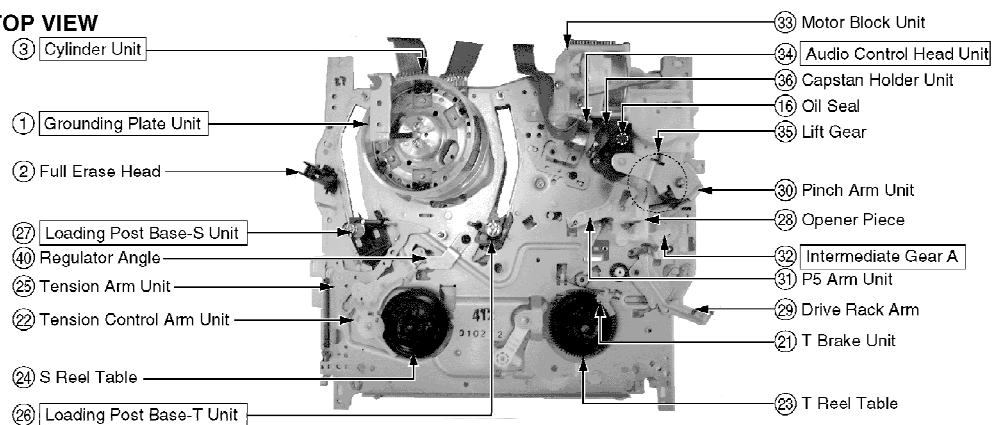
F: Alignment/Adjustment which is required when installing or replacing each Parts.

5.2.2. Inner Parts Location

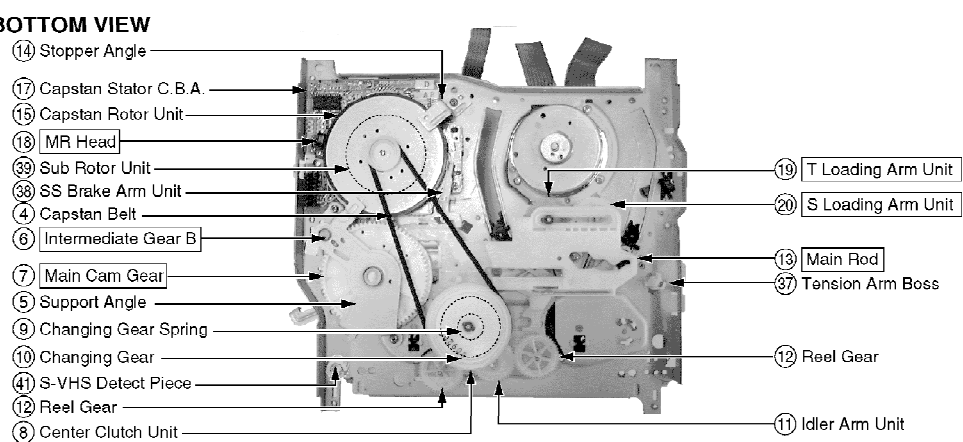
Note: BOX indicates alignment (Gear Alignment or Mechanical Adjustment) required when a part is replaced.

Fig. J1-1

TOP VIEW



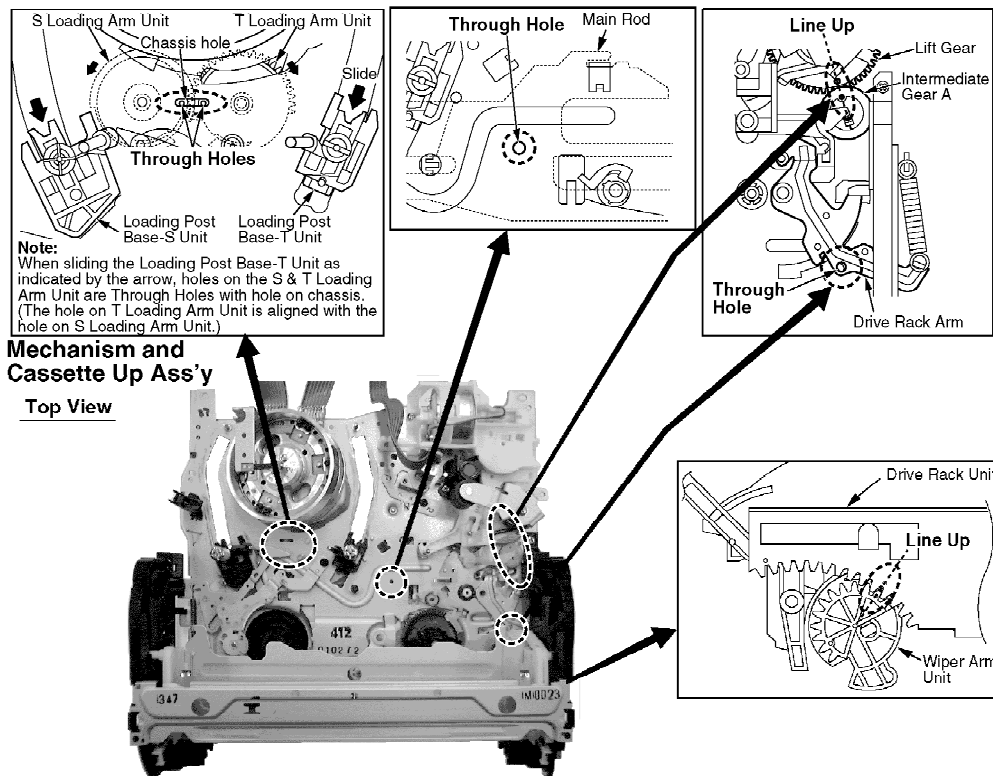
BOTTOM VIEW



5.2.3. EJECT Position Confirmation

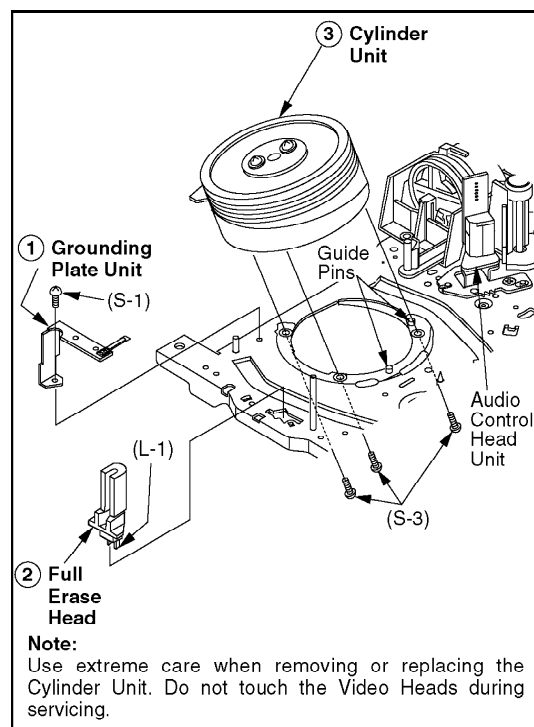
Fig. J1-2

Check the following alignment points to confirm that the Mechanism and Cassette Up Ass'y are in the **EJECT** Position from the top side.



5.2.4. Grounding Plate Unit, Full Erase Head, and Cylinder Unit

Fig. J2-1



5.2.4.1. Reassembly Notes

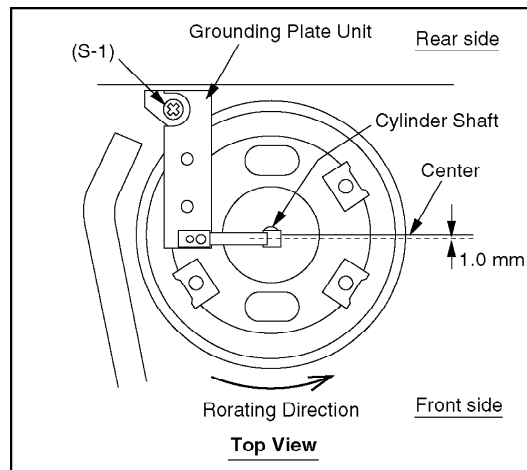
1. Adjustment of Grounding Plate Unit

A. After installing, make sure that the Grounding Plate Unit, on the top side of mechanism chassis, is positioned on the front side of the Cylinder shaft so that the center line of the plate is just less than 1.0 mm measured from the center of the Cylinder shaft.

If required, adjust the plate position by loosening Screw (S-1).
Never install the Grounding Plate Unit on the rear side of the Cylinder shaft.

Incorrect positioning will cause cylinder buzz.

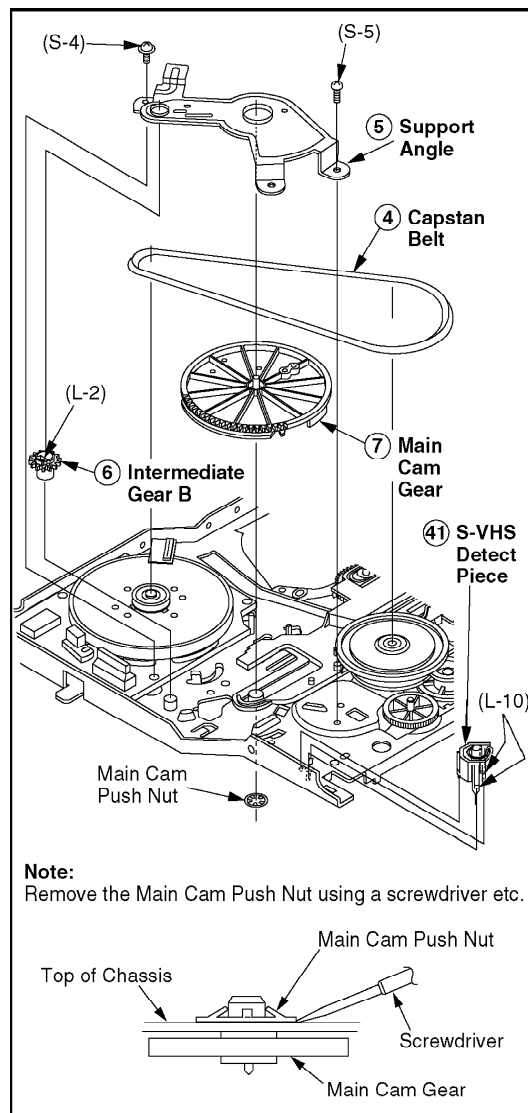
Fig. J2-2



2. After replacing the Cylinder Unit, clear the Total elapsed "Cylinder rotation" time (in hours) to 0. Refer to "**USAGE SCREEN MODE**" in SERVICE NOTES.

5.2.5. Capstan Belt, Support Angle, Intermediate Gear B, Main Cam Gear, and S-VHS Detect Piece

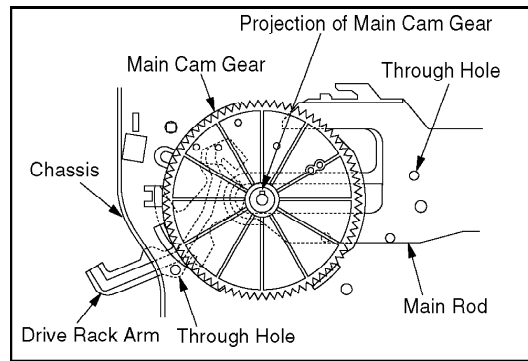
Fig. J3-1



5.2.5.1. Reassembly Notes

- 1. Alignment of Main Cam Gear, Drive Rack Arm, and Main Rod**
 - A. Confirm that the hole on Main Rod is a Through Hole with a hole on chassis.**
 - B. Confirm that the hole on Drive Rack Arm is a Through Hole with a hole on chassis.**
 - C. Install the Main Cam Gear so that the projection of Main Cam Gear is in the upward position as shown.**

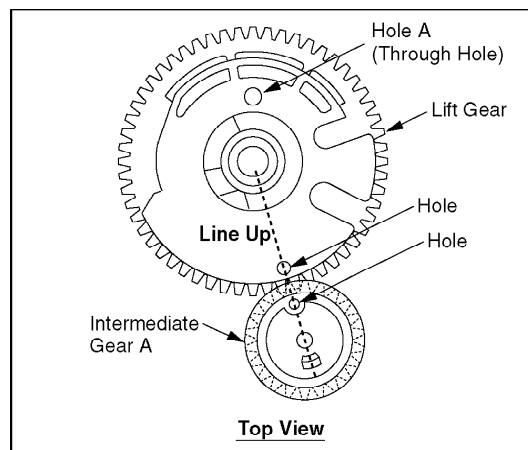
Fig. J3-2



2. Confirmation/Alignment of Intermediate Gear B, Main Cam Gear, and Intermediate Gear A

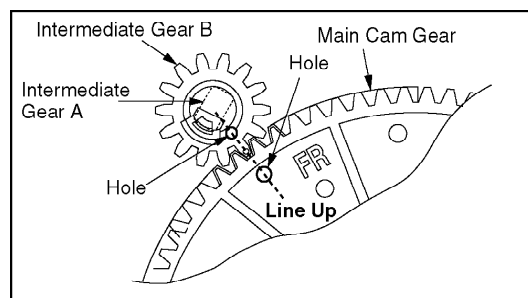
- A. Confirm that the Hole A on Lift Gear is a Through Hole with a hole on chassis.
- B. Confirm that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.

Fig. J3-3



- C. Install the Intermediate Gear B so that the hole on the Intermediate Gear B is aligned with the hole on the Main Cam Gear.

Fig. J3-4

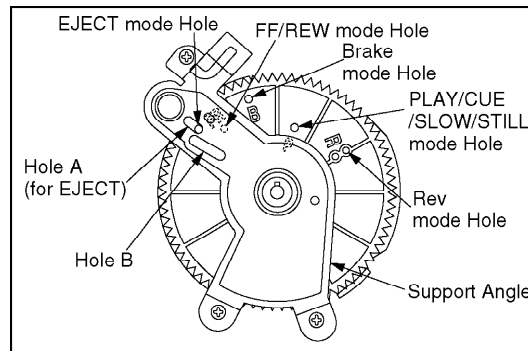


3. Holes on Main Cam Gear

- A. The EJECT mode Hole on Main Cam Gear should be a Through

Hole with Hole A on Support Angle in EJECT mode. The each mode Hole on Main Cam Gear should be a Through Hole with Hole B on Support Angle in each mode.

Fig. J3-5



4. Main Cam Gear Kit

A. Main Cam Gear is supplied as a Main Cam Gear Kit only (Kit No. VVGS0009).

Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut.

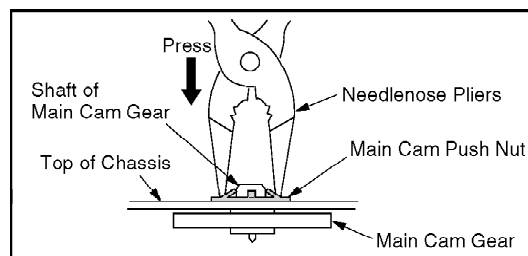
However, Main Cam Push Nut is available separately as a replacement part.

5. Installation of Main Cam Gear and Main Cam Push Nut

A. After installing the Support Angle, install the Main Cam Push Nut with Needlenose Pliers etc. so that it is flush with the chassis.

There may be some slight scratches on the Shaft of Main Cam Gear, when removing the Main Cam Gear. In case that the Main Cam Gear can be installed securely without tottering, it is fine to use the one. If any tottering, install all new parts.

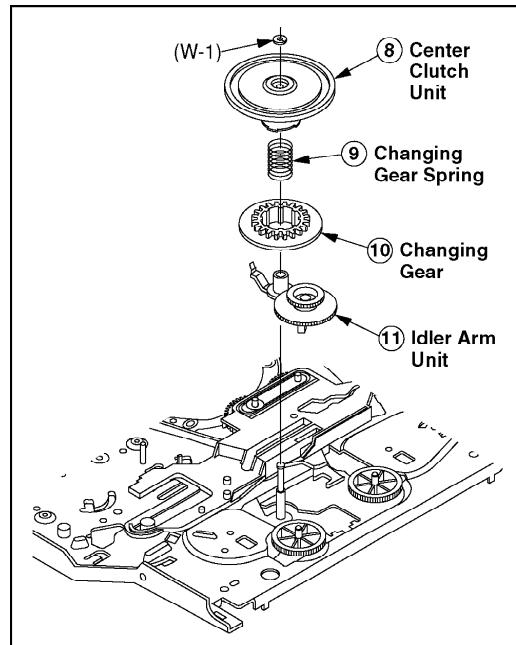
Fig. J3-6



6. The Main Cam Push Nut is not reusable. Install a new one.

5.2.6. Center Clutch Unit, Changing Gear Spring, Changing Gear, and Idler Arm Unit

Fig. J4-1

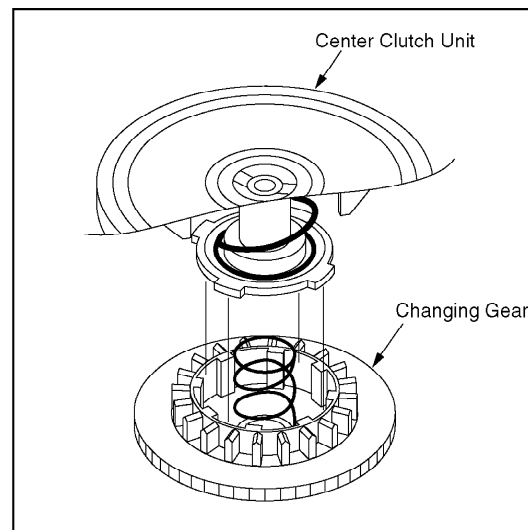


5.2.6.1. Reassembly Notes

1. Installation of Center Clutch Unit

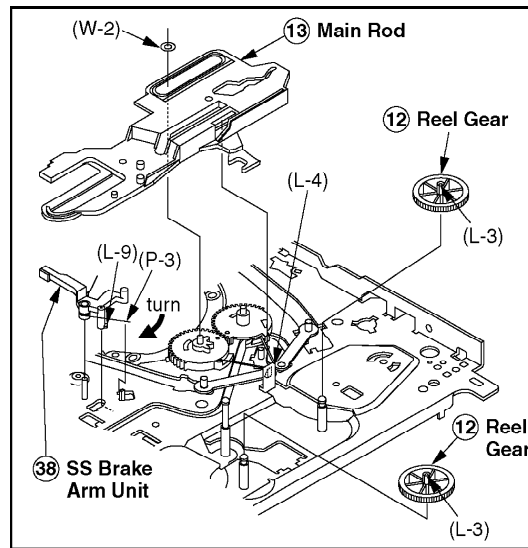
A. Fit the Center Clutch Unit into the Changing Gear.

Fig. J4-2



5.2.7. Reel Gear, Main Rod, and SS Brake Arm Unit

Fig. J5-1

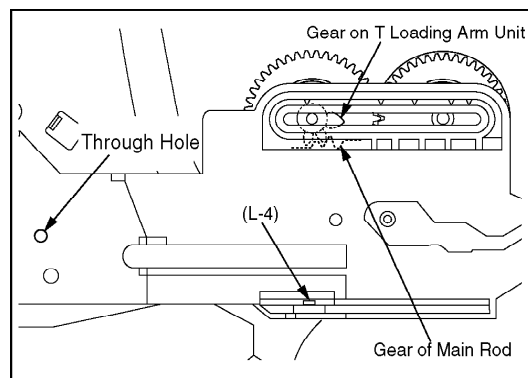


5.2.7.1. Reassembly Notes

1. Alignment of Main Rod and T Loading Arm Unit

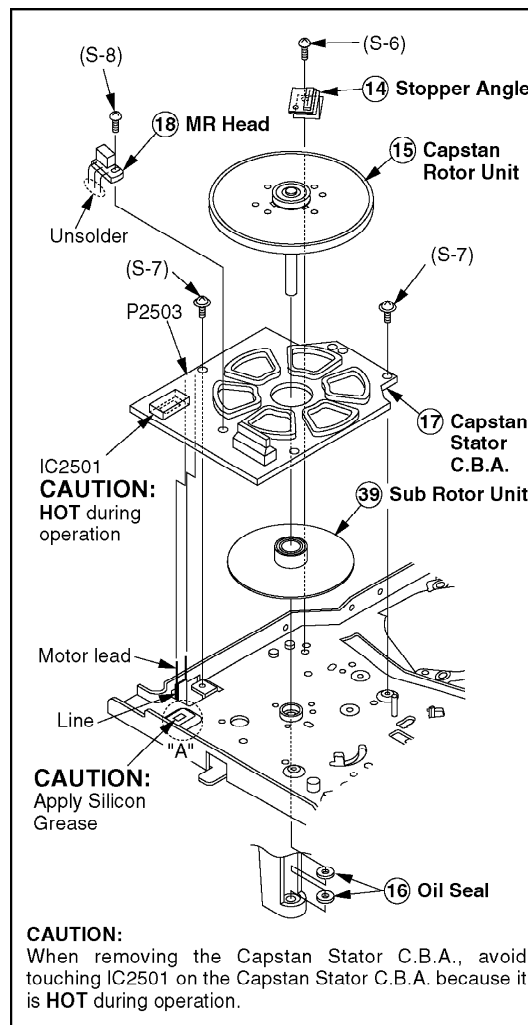
- A. Align the Gear on T Loading Arm Unit with Gear of Main Rod.
Confirm that the Hole on Main Rod is a Through Hole with a hole on chassis.

Fig. J5-2



5.2.8. Stopper Angle, Capstan Rotor Unit, Oil Seal, Capstan Stator C.B.A., MR Head, and Sub Rotor Unit

Fig. J6-1



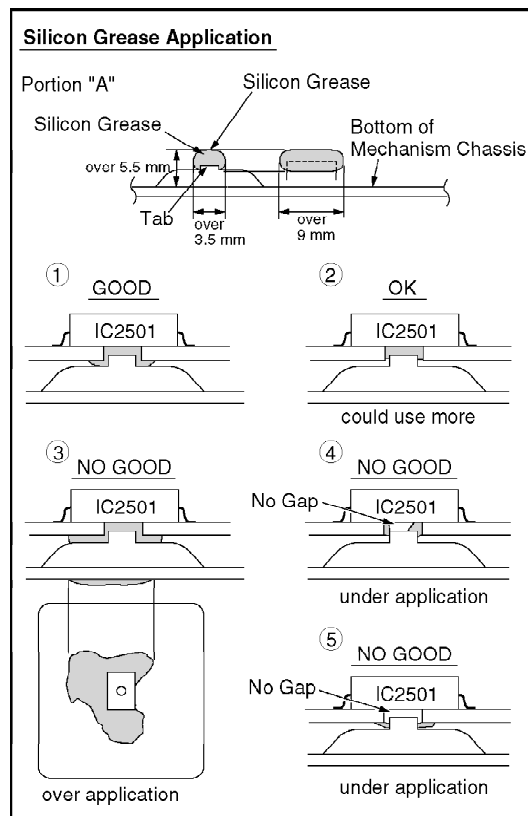
5.2.8.1. Reassembly Notes

1. Application of Silicon Grease

CAUTION:

When installing the IC2501 (AN3846SC) or Capstan Stator C.B.A., be sure to apply Silicon Grease (VFK1301) as shown. Be careful not to touch other parts with greased portion to prevent grease depletion.

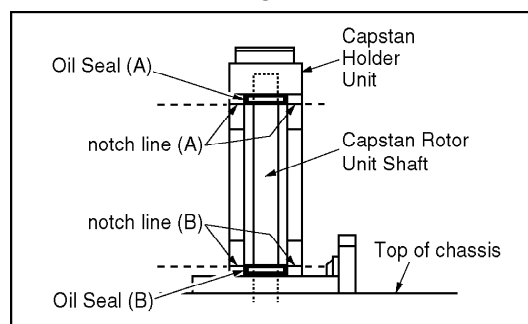
Fig. J6-2



2. Installation of Capstan Rotor Unit and Oil Seal

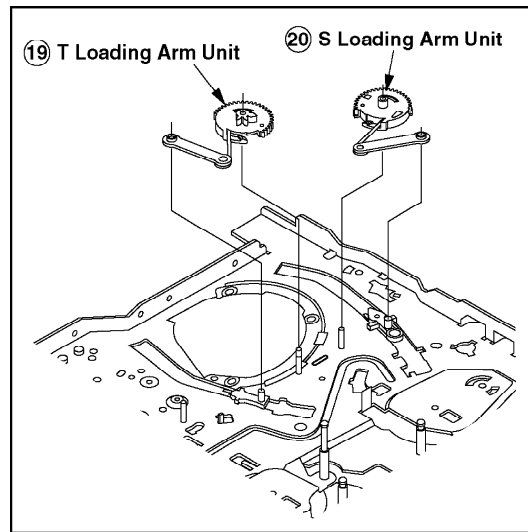
- A. Install the 2 Oil Seals into the Capstan Holder Unit. Then, insert the Capstan Rotor Unit Shaft into the hole of the Capstan Holder Unit so that shaft passes through 2 Oil Seals. Be careful not to scratch the Shaft or Capstan Holder Unit.
- B. Align the bottom of Oil Seal (A) with notch line (A).
Align the top of Oil Seal (B) with notch line (B).

Fig. J6-3



5.2.9. T Loading Arm Unit and S Loading Arm Unit

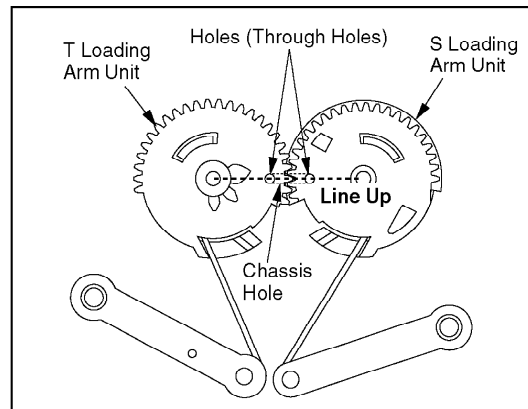
Fig. J7-1



5.2.9.1. Reassembly Notes

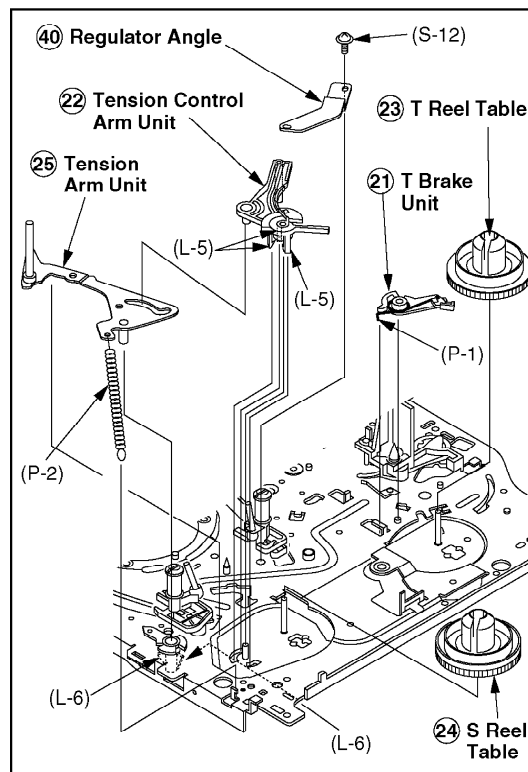
1. Alignment of T Loading Arm Unit and S Loading Arm Unit
 - A. Install the S Loading Arm Unit onto the chassis.
 - B. Install the T Loading Arm Unit so that the hole on T Loading Arm Unit is aligned with the hole on S Loading Arm Unit.
 - C. Confirm that the holes on the S & T Loading Arm Unit are Through Holes with hole on chassis.

Fig. J7-2



5.2.10. T Brake Unit, Tension Control Arm Unit, T Reel Table, S Reel Table, Tension Arm Unit, and Regulator Angle

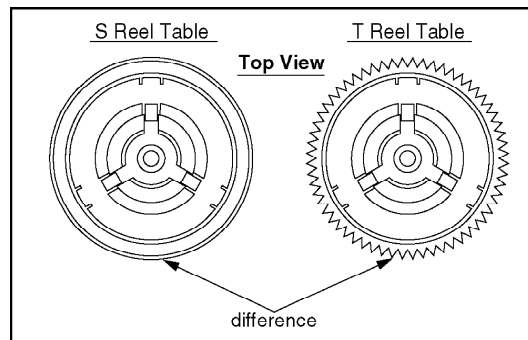
Fig. J8-1



5.2.10.1. Reassembly Notes

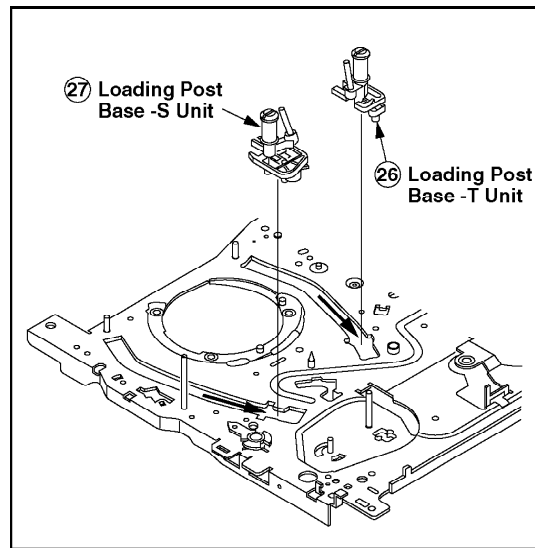
1. How to distinguish between S Reel Table and T Reel Table

Fig. J8-2



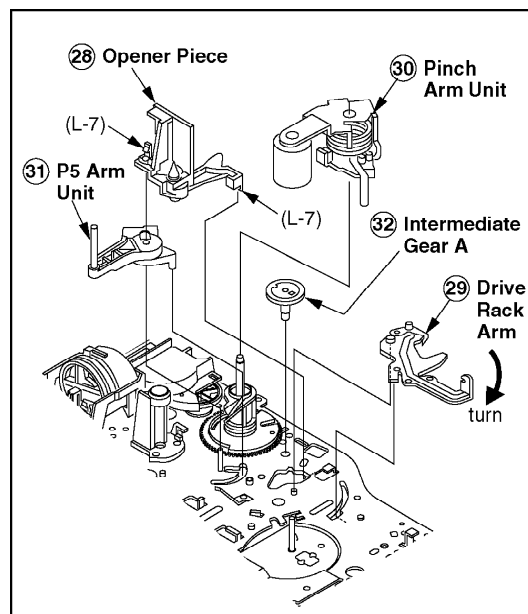
5.2.11. Loading Post Base -T Unit and Loading Post Base -S Unit

Fig. J9



5.2.12. Opener Piece, Drive Rack Arm, Pinch Arm Unit, P5 Arm Unit, and Intermediate Gear A

Fig. J10-1

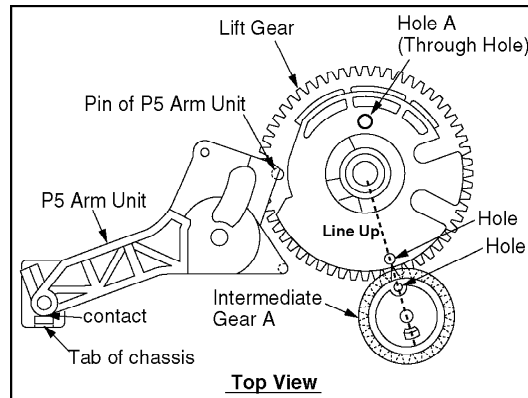


5.2.12.1. Reassembly Notes

1. Installation/Alignment of Intermediate Gear A, Lift Gear and P5 Arm Unit

- A. Rotate the Lift Gear so that Hole A on Lift Gear is a Through Hole with a hole on chassis.
- B. Install the Intermediate Gear A so that the hole on Intermediate Gear A is aligned with the hole on Lift Gear.
- C. Install the P5 Arm Unit so that it contacts with the tab of chassis.

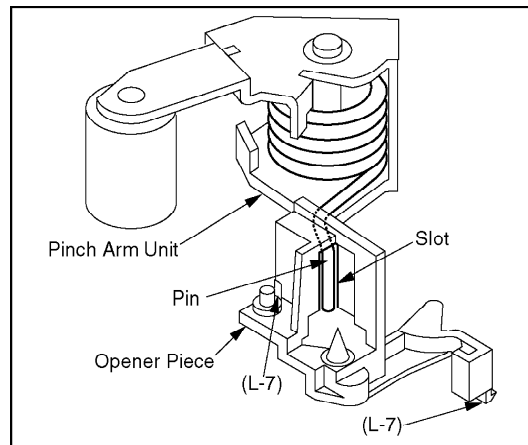
Fig. J10-2



2. Installation of Opener Piece

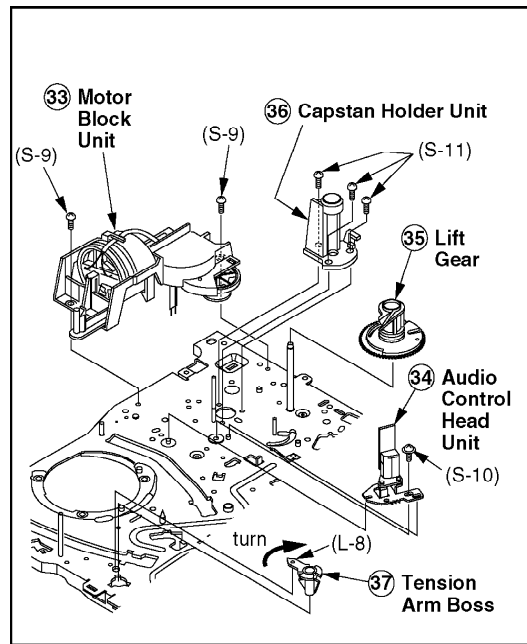
A. Install the Opener Piece so that the slot of the Opener Piece is inserted to the Pin of Pinch Arm Unit

Fig. J10-3



5.2.13. Motor Block Unit, Audio Control Head Unit, Lift Gear, Capstan Holder Unit, and Tension Arm Boss

Fig. J11



5.3. CASSETTE UP ASS'Y SECTION

This chart indicates Step/Location No. of Parts to be serviced and prior steps to gain access items to be serviced when disassembling. When reassembling, perform the step(s) in the reverse order.

Step/Location No.	Prior Step(s)	Part	Fig. No.	Remove	Alignment/Adjustment
①	-----	Top Plate	K1-1	(L-1), (L-2)	
②	1	Wiper Arm Unit	K1-1	2(L-3)	Gear Alignment
③	1,2	Holder Unit	K1-1	-	
④	-----	Opener Lever	K2	2(L-4)	
⑤	1,2,3,4	Drive Rack Unit	K2	-	
↑ A ↑ B ↑ C ↑ D ↑ E ↑ F					

How to read chart shown above:

A: Order of Procedure steps.

When reassembling, perform steps(s) in reverse order.

These numbers are also used as the identification (location) No. of parts in Figures.

B: Steps to be completed prior to the current step.

C: Part to be removed or installed.

D: Fig. No. showing Procedure or Part Location.

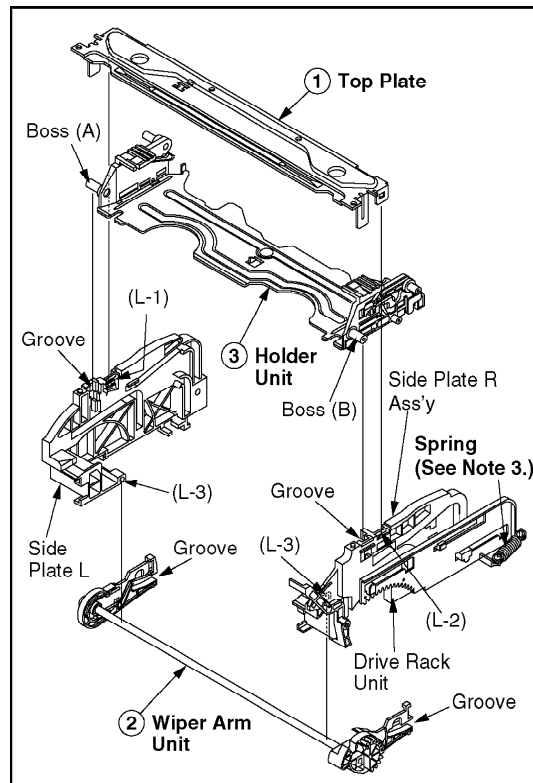
E: Identification of part to be removed, unhooked, unlocked, released, unplugged or unsoldered.

(S-1) = Screw (S-1), (L-1) = Locking Tab (L-1), (W-1) = Washer (W-1), (P-1) = Spring (P-1), (C-1) = Cut Washer (C-1)

F: Alignment/Adjustment which is required when installing or replacing each Parts.

5.3.1. Top Plate, Wiper Arm Unit, and Holder Unit

Fig. K1-1

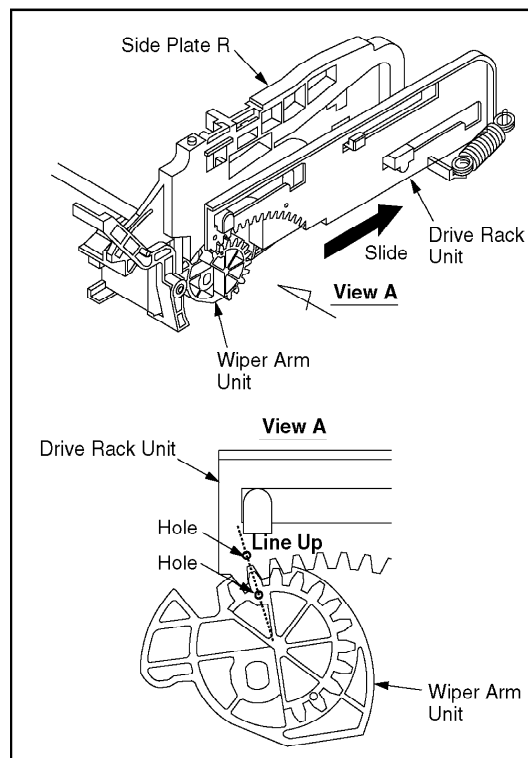


5.3.1.1. Reassembly Notes

1. Alignment of Wiper Arm Unit and Drive Rack Unit

- A. Slide the Drive Rack Unit to the far right as indicated by the arrow.
- B. Install the Wiper Arm Unit so that the hole on the Wiper Arm Unit is aligned with the hole on the Drive Rack Unit.

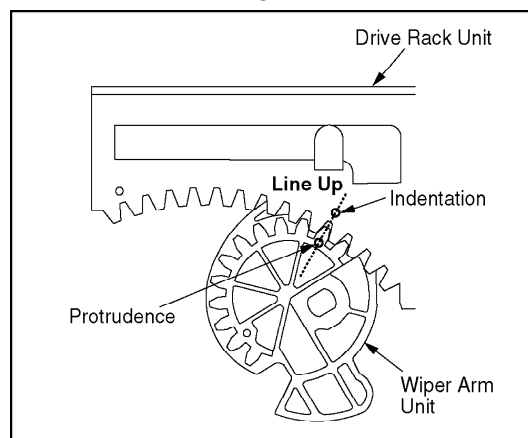
Fig. K1-2



2. Installation of Holder Unit

- A. Turn the Wiper Arm Unit so that the grooves on each end are aligned with the each groove on Side Plate L and R.
- B. Insert Holder Unit boss (A) and (B) into the grooves as shown in Fig. K1-1.
- C. Finally, in the EJECT Position, confirm that the protrudence on the Wiper Arm Unit is aligned with the indentation on the Drive Rack Unit.

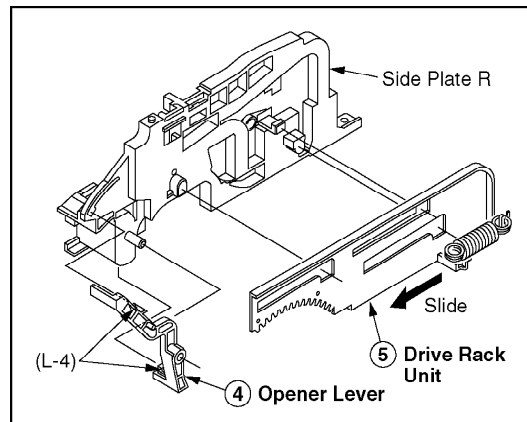
Fig. K1-3



3. Make sure to hook the spring to the Drive Rack Arm of Mechanism chassis.

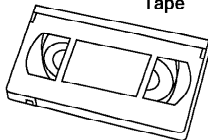
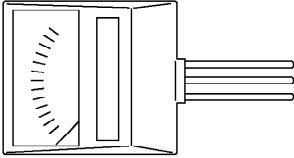
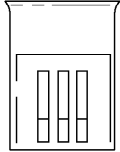
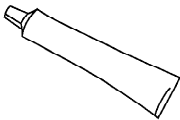
5.3.2. Opener Lever and Drive Rack Unit

Fig. K2



6. ADJUSTMENT PROCEDURES

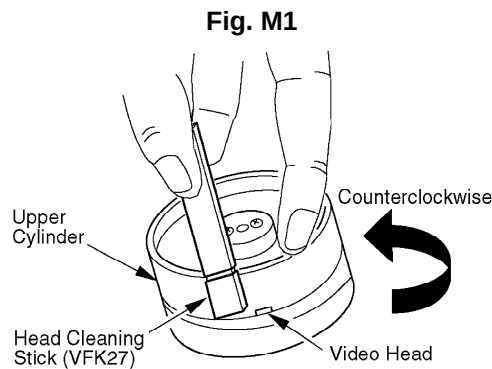
6.1. SERVICE FIXTURES AND TOOLS

VFMS0003H6 VHS Alignment Tape  Video Audio Color Bar & Monoscope 6kHz(MONO)	Back Tension Meter (Made in USA., Purchase Locally) 	VFK27 Head Cleaning Stick 
VFK1301 Silicon Grease 	VFKS0081 Grease 	VFK0329 Post Adjustment Driver 
VFK0330 H-Position Adjustment Driver 		

6.2. MECHANICAL ADJUSTMENT

6.2.1. CLEANING PROCEDURE FOR THE UPPER CYLINDER UNIT

1. While slowly turning the Upper Cylinder Unit counterclockwise by hand, gently rub the Video Heads with a Head Cleaning Stick (VFK27) moistened with Ethanol.
When using a Cleaning Cassette, make sure to use "DRY" type only and be aware that excessive use can shorten head life.



Note:

1. Do not rub vertically or apply excess pressure to the Video Heads. Do not turn the Upper Cylinder Unit clockwise while cleaning.
2. After cleaning, use a Dry Head Cleaning Stick (VFK27) to remove any Ethanol remaining on the cylinder tape path. Otherwise, tape damage will occur.

6.2.2. ADJUSTMENT PROCEDURES

6.2.2.1. BACK TENSION CONFIRMATION

Purpose:

To fine adjust the Back Tension so that the tape runs smoothly with a constant tension.

Symptom of Misadjustment:

- 1) If the tape tension is less than the specified value, the tape cannot come into proper contact with the Video Heads, resulting in poor picture playback.
- 2) If the tape tension is too high, the tape will soon be damaged.

Equipment Required:

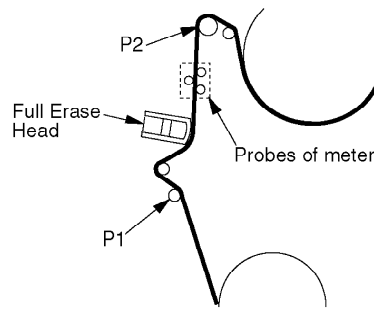
Back Tension Meter (Made in U.S.A., Purchase Locally)
VHS Cassette Tape (120-Minute Tape)

Specification:

20 gf $\pm$ 2.5 gf
(0.196 N $\pm$ 0.025 N)

1. Play back a T120 cassette tape from the beginning for approx. 10 to 20 seconds to stabilize tape movement.
2. Insert a Tension Meter into tape path and measure the back tension.

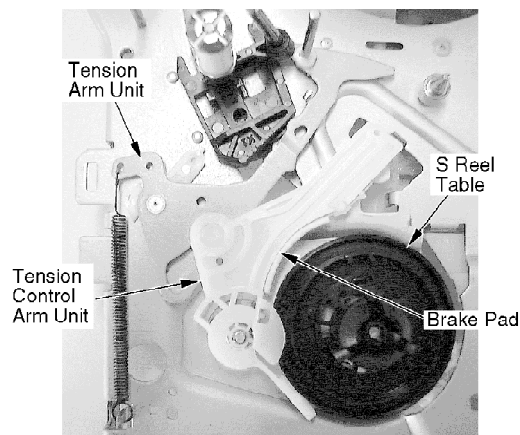
Fig. M2-1



3. If the reading is out of specification, make sure that there is no dust or foreign material between the Brake Pad of Tension Control Arm Unit and the S Reel Table.

After cleaning, the reading of tension measurement is still out of specification, replace the Tension Arm Unit and the Tension Control Arm Unit.

Fig. M2-2



Note:

1. Be sure that the three probes of the meter are all in solid contact with the tape, but not touching any other parts of the mechanism.
2. It is recommended that measurements should be repeated at least three (3) times because the tension meter is very sensitive to external vibrations.

6.2.2.2. MR HEAD GAP ADJUSTMENT

Purpose:

To properly pick up the FG Signal.

Symptom of Misadjustment:

If the FG Signal is not properly picked up, Servo Operation cannot

be achieved.

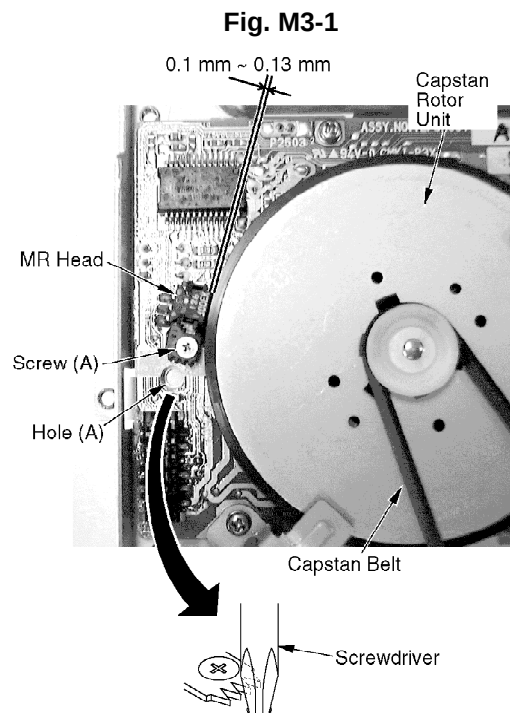
Equipment Required:

Oscilloscope

Specification:

0.1 mm ~ 0.13 mm

1. Remove the VCR Chassis Unit and then place it upside down.
2. Remove the Main C.B.A.
3. Slightly loosen Screw (A). Then set the Screwdriver (Phillips Driver) into the Hole (A). Turn the screwdriver clockwise until the MR Head touches the rotor. Then turn it slightly counterclockwise to make the clearance as specified.
4. Tighten Screw (A).
5. Reinstall the Main C.B.A.



Note:

Do not touch the outside circumference of the rotor surface with any tool and keep magnetic material away from the rotor magnet (especially metal particles).

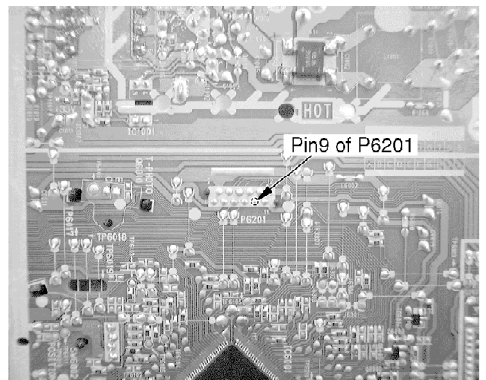
Confirmation of Signal Level

1. Place the unit in Service Position (2). Refer to "**SERVICE POSITION**"

" in SERVICE NOTES.

2. Supply a Video Signal to the video input jack.
3. Insert a cassette tape and place the unit in SLP recording mode.
4. Connect the oscilloscope to Pin 9 of P6201 on the Main C.B.A.
Confirm that the signal level is greater than 20 mV [P-P].

Fig. M3-2



Main C.B.A. (foil side)

6.2.2.3. TAPE INTERCHANGEABILITY ADJUSTMENT

Note:

To perform these adjustment/confirmation procedures, enter the Tracking center mode.

Equipment Required:

- Dual Trace Oscilloscope
- VHS Alignment Tape (VFMS0003H6)
- Post Adjustment Driver (VFK0329)
- H-Position Adjustment Driver (VFK0330)

6.2.2.3.1. ENVELOPE OUTPUT ADJUSTMENT

The height of the P2 and P3 Posts replacement part is preadjust at the factory.

Purpose:

To achieve a satisfactory picture and secure precise tracking.

Symptom of Misadjustment:

If the envelope is output poorly, much noise will appear in the picture. Then the tracking will lose precision and the playback picture will be distorted by any slight variation of the tracking control circuit.

Equipment Required:

- Post Adjustment Driver (VFK0329)

1. Insert the alignment tape.
2. Press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.
The power comes on and the unit goes into service mode.
3. Play back the alignment tape.
4. To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.
5. Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.
6. Confirm that the RF envelope is flat enough ($V_1/V\text{-max.}$ is 0.7 or more). If not, with Post Adjustment Driver, adjust P2 and P3 post height so that the envelope waveform becomes as flat ($V_1/V\text{-max.}$ is 0.7 or more) as possible (No envelope drop). If the envelope drop appears on the left-half of the waveform, adjust P2 post height. If the envelope drop appears on the right-half of the waveform, adjust P3 post height.

CAUTION:

Overtightening P2 and P3 posts may cause the threads to strip.

Note:

It will be possible to confirm Step 6 according to following steps.

1. Release the Tracking center mode.
2. Press the Tracking Control Up or Down button on remote control.
Make sure that the envelope waveform remains flat. If not, readjust P2 and/or P3 post heights.

Fig. M4-1

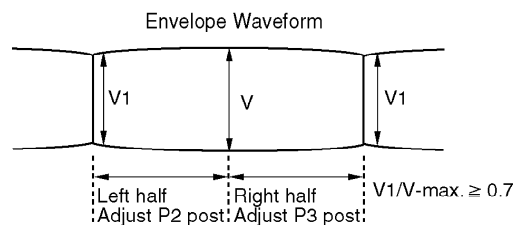
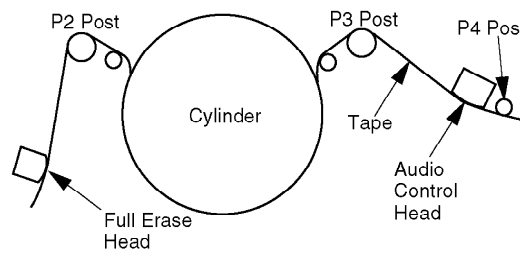
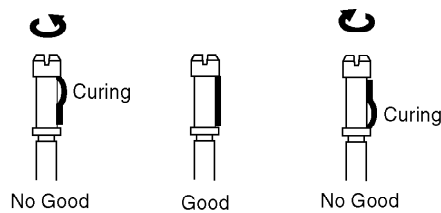


Fig. M4-2



7. After adjustment, confirm that the tape travels without curling at P2 and P3 posts.

Fig. M4-3



8. To release from Tracking center mode, press PLAY or STOP button.

6.2.2.3.2. AUDIO CONTROL HEAD TILT ADJUSTMENT

Purpose:

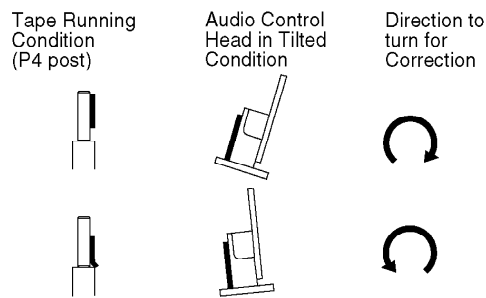
To confirm that the tape runs smoothly. In particular, confirm that the tape properly picks up the Audio Signal at the upper part of the head and the Control Signal at the lower part of the head.

Symptom of Misadjustment:

If the tilt of the Audio Control Head is poorly adjusted, the tape will eventually be damaged. An intermittent Blue screen may be seen in Playback.

- 1. Play back a T120 cassette tape and check that the tape travels smoothly between the upper and lower guides of the P4 post.**
- 2. If necessary, adjust Black Screw (B) clockwise until the tape begins to curl at the lower edge of the P4 post. Then adjust the screw counterclockwise until the curling is eliminated.**

Fig. M5



6.2.2.3.3. AUDIO CONTROL HEAD HEIGHT ADJUSTMENT

The height of the Audio Control Head replacement part is preset at the factory.

Purpose:

To be sure the tape runs properly along the Control Head.

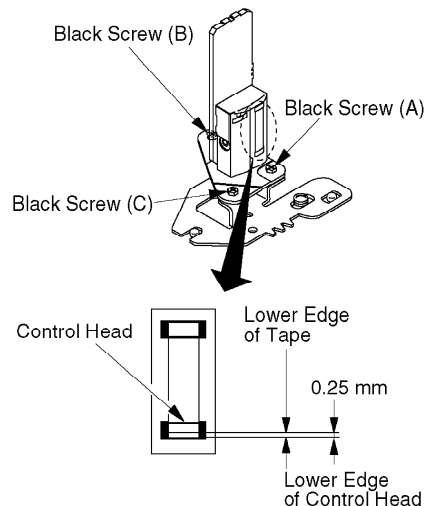
Symptom of Misadjustment:

If the control signal is not properly picked up, Servo Operation cannot be achieved. A Blue screen will be seen in Playback.

This confirmation is required when the Audio Control Head is replaced.

1. Play back a T120 cassette tape and check that the lower edge of the tape runs approximately 0.25 mm above the lower edge of the Audio Control Head.
2. If necessary, adjust Black Screws (A) and (B) clockwise to lower the tape or counterclockwise to raise.

Fig. M6



6.2.2.3.4. AUDIO CONTROL HEAD AZIMUTH ADJUSTMENT

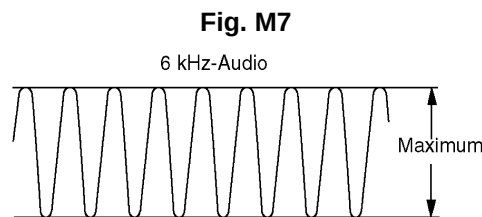
Purpose:

To adjust the position and height of the Audio Control Head so that it meets the tape tracks properly.

Symptom of Misadjustment:

If the position of the Audio Control Head is not properly adjusted, the Audio S/N Ratio is poor.

1. Connect the oscilloscope to the audio output jack on the rear side of the deck.
2. Play back the 6 kHz Monaural Audio portion of the alignment tape.
3. Adjust Black Screw (C) on the Audio Control Head base so that the output level is at maximum.



4. Confirm the height of the Audio Control Head is proper. If not, readjust Black Screws (A) and (B).

6.2.2.3.5. AUDIO CONTROL HEAD HORIZONTAL POSITION ADJUSTMENT

Purpose:

To adjust the Horizontal Position of the Audio Control Head.

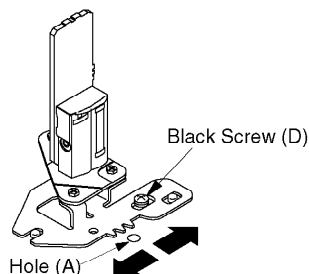
Symptom of Misadjustment:

If the Horizontal Position of the Audio Control Head is not properly adjusted, a maximum envelope cannot be obtained at the Neutral Position of the Tracking Control Circuit.

1. Insert the alignment tape.
2. Press and hold VCR/TV button and CH DOWN buttons on VCR together over 5 seconds in power off condition.
The power comes on and the unit goes into service mode.
3. Play back the alignment tape.
4. To enter Tracking center mode, press PLAY button in Play back mode. "TRACKING CENTER" will be displayed on the TV monitor.
5. Connect the oscilloscope to TP3002 on the Video Signal Process Section of the Main C.B.A. Use TP6205 as a trigger.
6. Loosen the Black Screw (D) and tighten it slightly. Set the H-Position Adjustment Driver into the Hole (A). Then slowly turn the

fixture either clockwise or counterclockwise so that the envelope is at maximum.

Fig. M8



7. Tighten Black Screw (D).

8. To release from Tracking center mode, press PLAY or STOP button.

Note:

Old type of H-Position Adjustment Driver (VFK0136) can be used for this adjustment.

6.3. ELECTRICAL ADJUSTMENT

6.3.1. EVR (Electronic Variable Resister) ADJUSTMENT WITH THE REMOTE CONTROL

This unit has electronic technology using I2C Bus concept. The PG SHIFTER ADJUSTMENT is adjusted by using " On Screen Display " and the remote control instead of adjusting mechanical controls (VR).

6.3.2. TEST EQUIPMENT

To do all of these electrical adjustments, the following equipment is required.

1. Dual-Trace Oscilloscope

Voltage Range: 0.001 V to 50 V/Div.

Frequency Range: DC to 50 MHz

Probes: 10:1, 1:1

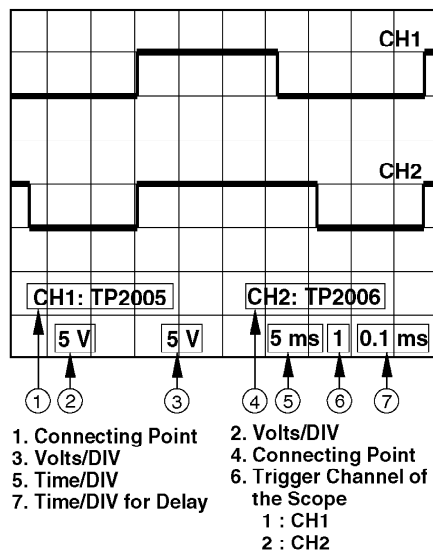
2. Isolation Transformer (Variable)

3. VHS Alignment Tape (VFMS0003H6)

4. TV monitor

6.3.3. HOW TO READ THE ADJUSTMENT PROCEDURES

Fig.E1



6.3.4. PG SHIFTER ADJUSTMENT

Purpose:

Determine the Video Head Switching Point during Playback.

Symptom of Misadjustment:

May cause Head Switching Noise and/or Vertical Jitter.

Test Point :

TP3001 (Main C.B.A.),
TP6205 (Main C.B.A.)

Specification:

$T = 6 H \pm 0.5 H$ (0.38 ms $\pm$ 0.03 ms) Mode : SP Playback

Mode :

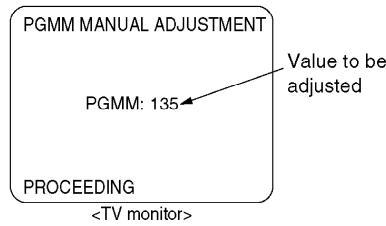
SP Playback

Equipment :

Oscilloscope,
VHS Alignment Tape (VFMS0003H6),
TV monitor

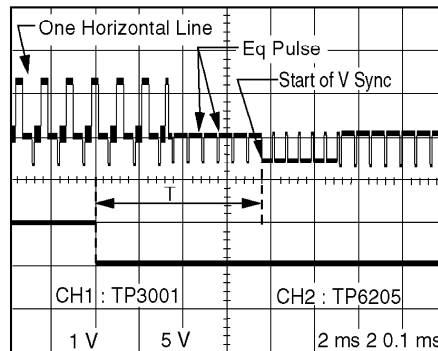
1. Insert the VHS Alignment Tape and play back in SP mode.
2. Press VCR/TV button on the unit and 3 button on the remote control together to enter EVR PG SHIFTER ADJUSTMENT Mode. Then, "PGMM MANUAL ADJUSTMENT" menu will appear on the TV monitor.

Fig.E2-1



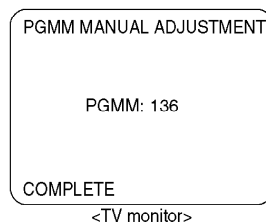
3. Connect the channel-1 scope probe to TP3001 and the channel-2 scope probe to TP6205. Used TP6205 as a trigger.
4. Adjust value so that the trailing edge of the head switching pulse is placed $6 H \pm 0.5 H$ ($0.38 \text{ ms} \pm 0.03 \text{ ms}$) before the start of the vertical sync pulse by pressing CH UP and CH DOWN buttons on the remote control.

Fig.E2-2



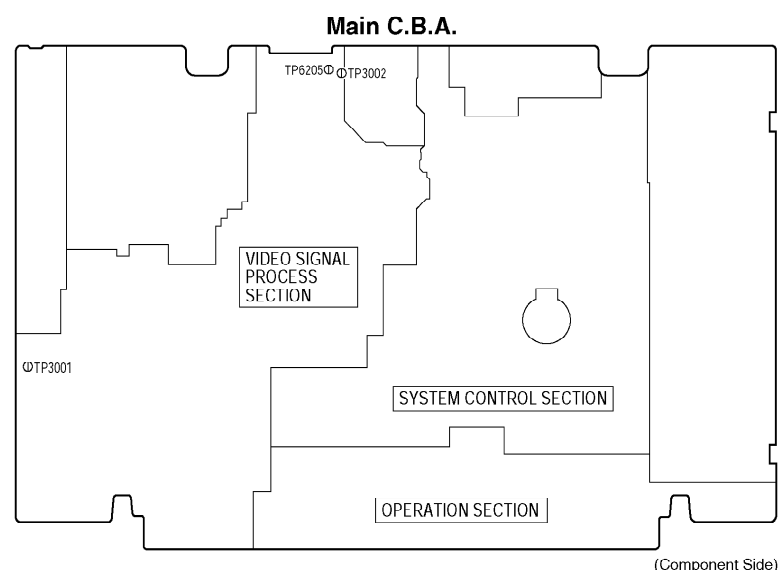
5. After adjustment is completed, press REC button on the remote control. Then " COMPLETE " will appear on the TV monitor and adjusted value will be written to Memory IC (IC6005).

Fig.E2-3



6. Press STOP button on the remote control to release from EVR PG SHIFTER ADJUSTMENT MODE.

6.4. TEST POINTS AND CONTROL LOCATION



FUNCTION OF IMPORTANT TEST POINTS	
TP3001	Video Signal to Jack
TP3002	PB Video envelope signal
TP6205	Head SW.

Test Point Information

① Test Point with a jumper wire across a hole in the P.C.B.

7. SCHEMATIC DIAGRAMS

7.1. SCHEMATIC DIAGRAM & CIRCUIT BOARD LAYOUT NOTES

7.2. MAIN SCHEMATIC DIAGRAMS

7.3. OPERATION SCHEMATIC DIAGRAM

7.4. S-VHS JACK SCHEMATIC DIAGRAM

7.5. CAPSTAN STATOR SCHEMATIC DIAGRAM

7.6. INTERCONNECTION SCHEMATIC DIAGRAM

7.7. SIGNAL WAVEFORMS

7.8. VOLTAGE CHART

8. CIRCUIT BOARD LAYOUT

8.1. MAIN / S-VHS JACK C.B.A.

8.2. OPERATION C.B.A.

8.3. CAPSTAN STATOR C.B.A.

9. BLOCK DIAGRAMS

9.1. POWER SUPPLY BLOCK DIAGRAM

9.2. VIDEO SIGNAL PATH BLOCK DIAGRAM

9.3. AUDIO SIGNAL PROCESS BLOCK DIAGRAM

9.4. Hi-Fi AUDIO SIGNAL PATH BLOCK DIAGRAM

9.5. SYSTEM CONTROL BLOCK DIAGRAM

9.6. SERVO BLOCK DIAGRAM

9.7. OPERATION BLOCK DIAGRAM

9.8. ADVANCE BLOCK DIAGRAM

10. EXPLODED VIEWS

10.1. MECHANISM (TOP) SECTION

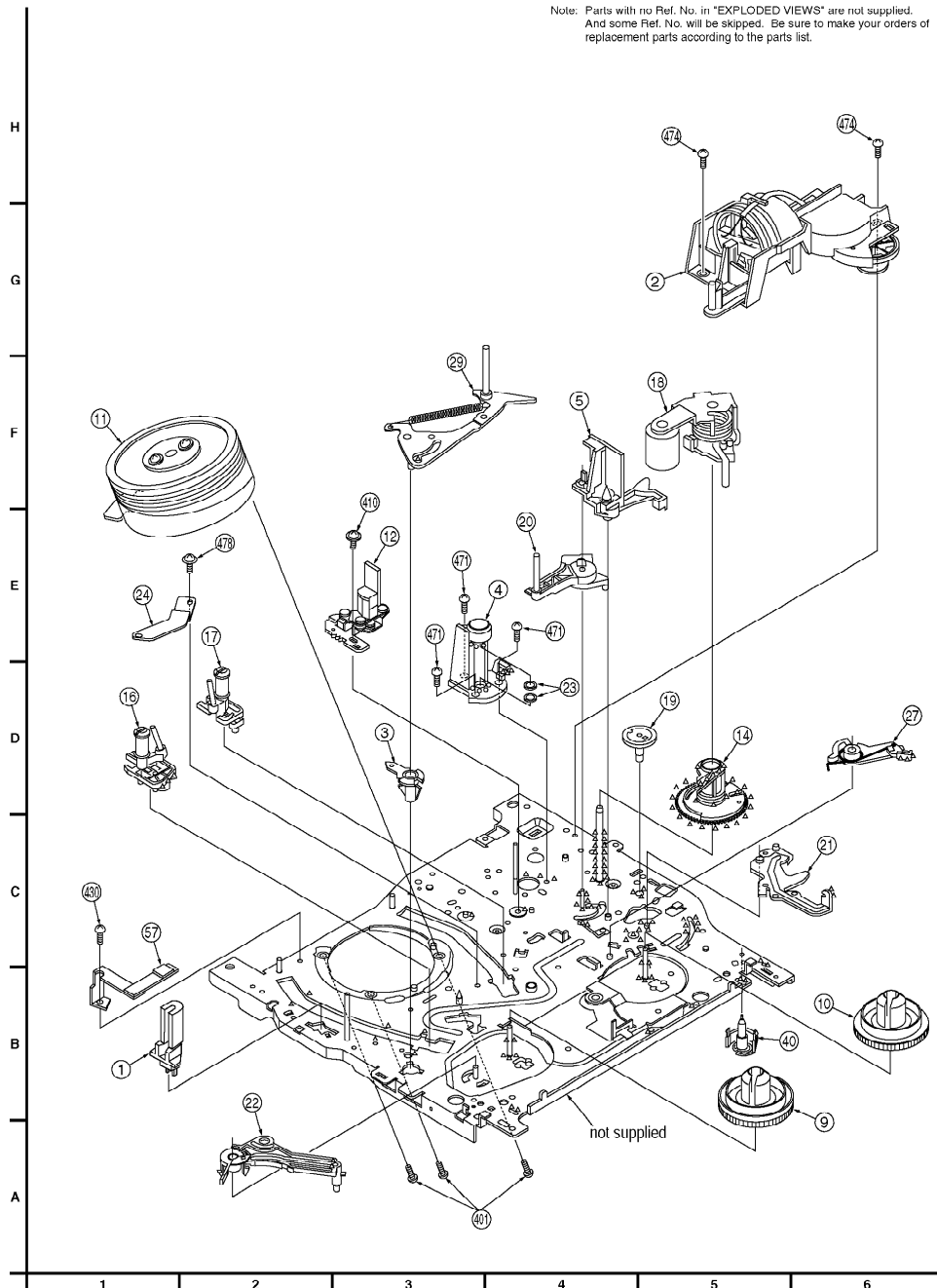
1 MECHANISM (TOP) SECTION

LUBRICATION POINTS

When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
○ ○ ○	Spindle Oil	Purchase from Local Supplier	-----
△ △ △	Grease	Available from Factory	VEKS0081

Note: Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied.
And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.



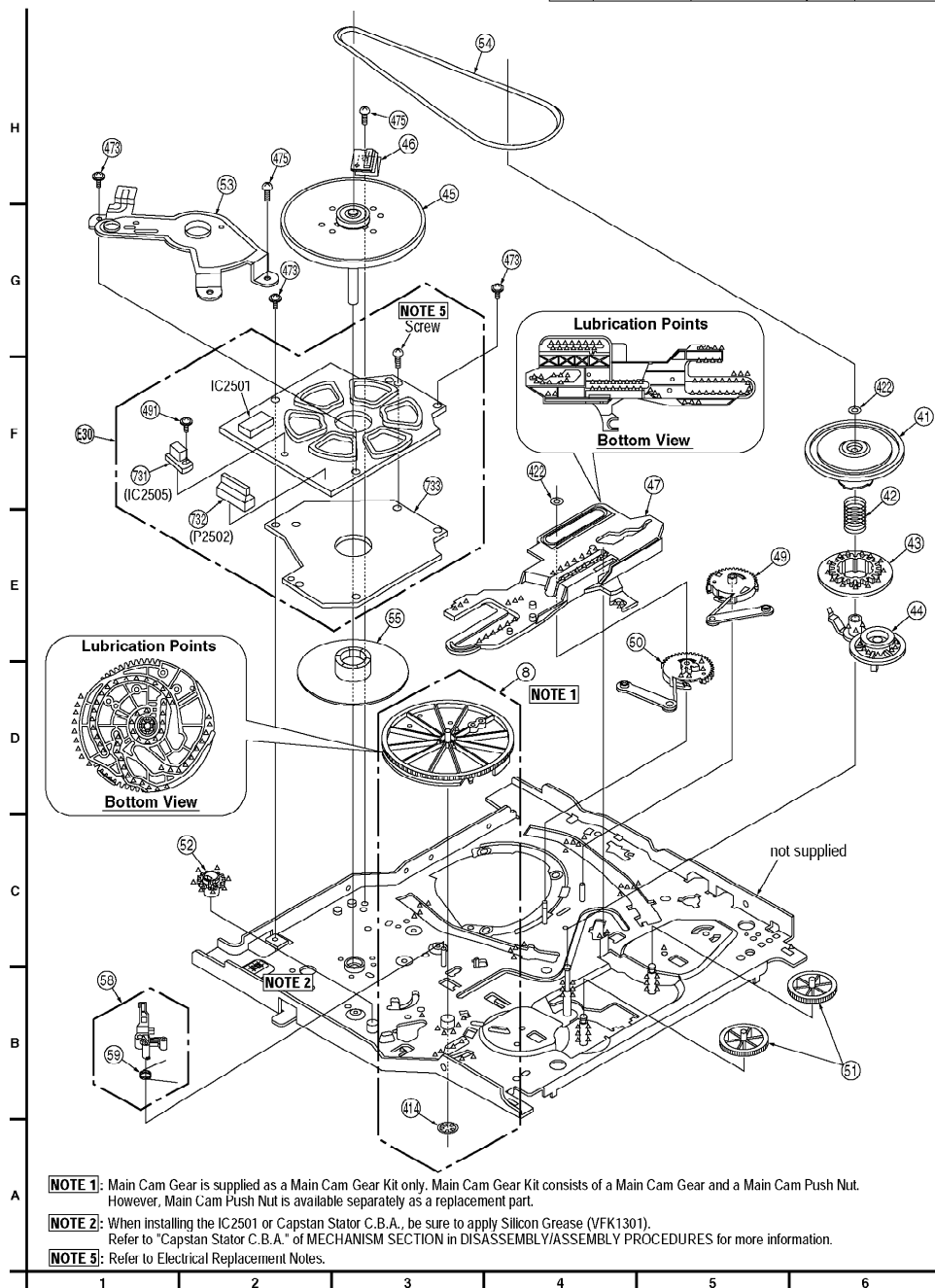
10.2. MECHANISM (BOTTOM) SECTION

2 MECHANISM (BOTTOM) SECTION

LUBRICATION POINTS

When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

Mark	Kind of Lubricant	Availability	Part Number
X X X	Silicon Grease	Available from Factory	VFK1301
Δ Δ Δ	Grease	Available from Factory	VFKS0081

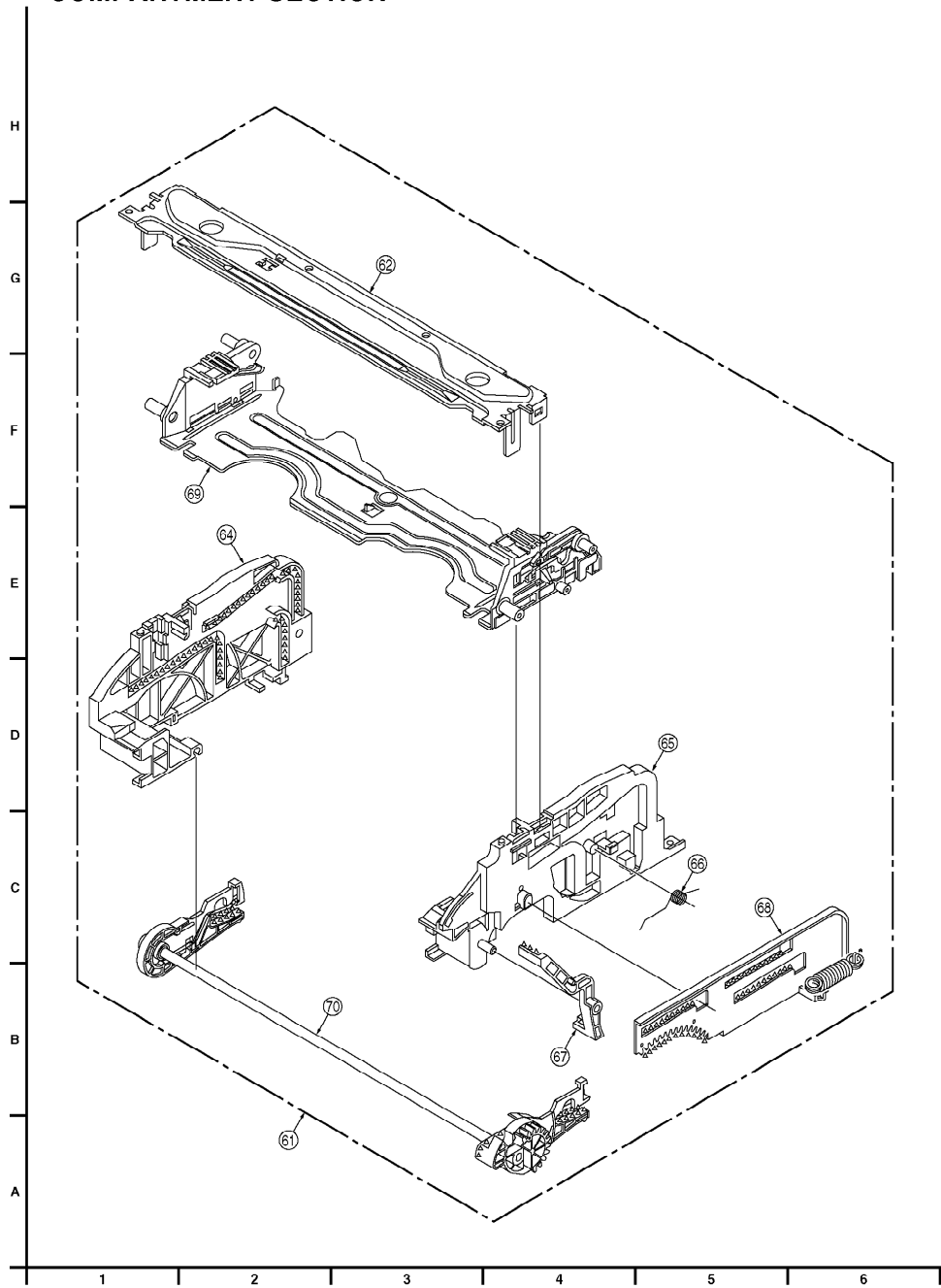


10.3. CASSETTE UP COMPARTMENT SECTION

③ CASSETTE UP COMPARTMENT SECTION

LUBRICATION POINTS
When the marked parts are replaced, apply the recommended lubricants or adhesive for better maintenance of the unit.

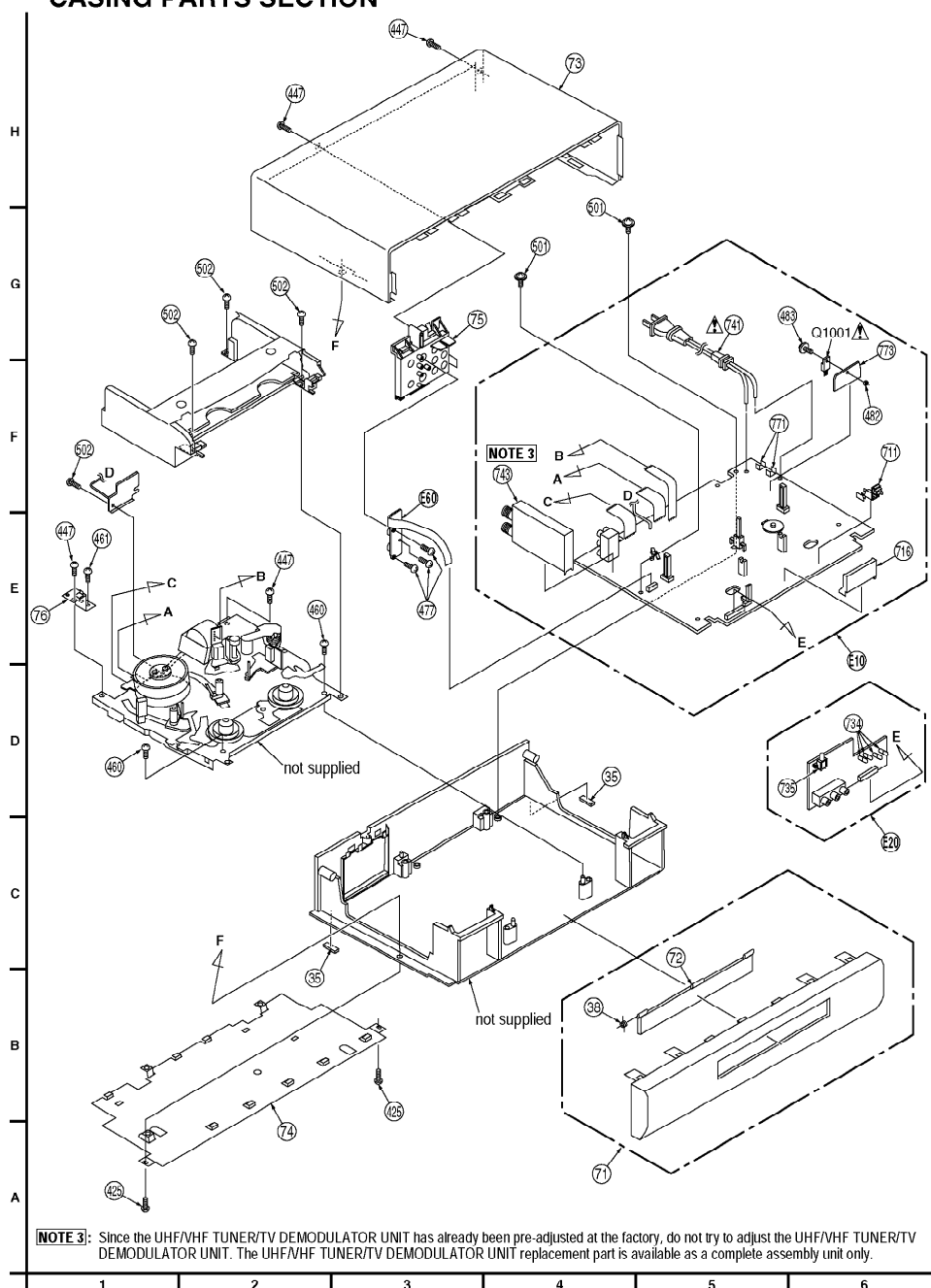
Mark	Kind of Lubricant	Availability	Part Number
△△△	Grease	Available from Factory	VFKS0081



10.4. CHASSIS FRAME AND CASING PARTS SECTION

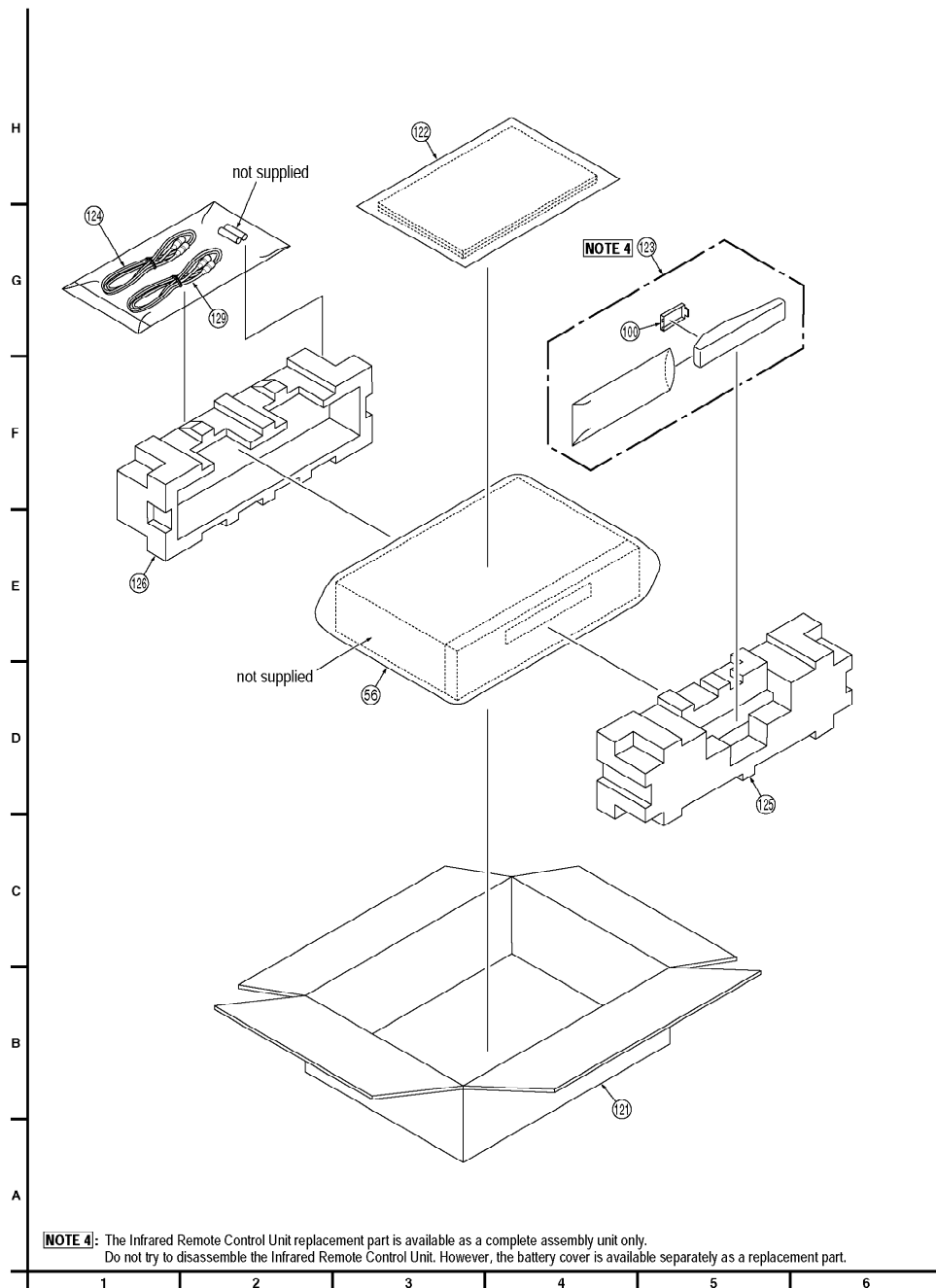
4 CHASSIS FRAME AND CASING PARTS SECTION

IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.



10.5. PACKING PARTS AND ACCESSORIES SECTION

5 PACKING PARTS AND ACCESSORIES SECTION



11. REPLACEMENT PARTS LISTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

11.1. REPLACEMENT NOTES

11.1.1. General Notes

1. Use only original replacement parts:

To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list.

2. IMPORTANT SAFETY NOTICE

Components identified by the sign  have special characteristics important for safety. When replacing any of these components, use only the specified parts.

3. SPECIAL NOTE

All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "ELECTROSTATICALLY SENSITIVE (ES) DEVICES" section of this service manual.

4. Parts with no Ref. No. in "EXPLODED VIEWS" are not supplied. And some Ref. No. will be skipped. Be sure to make your orders of replacement parts according to the parts list.
5. Parts different in shape or size may be used. However, only interchangeable parts will be supplied as service replacement parts.
6. All of parts are supplied from MKI.
7. Item numbers with capital letter E (Example: E10, E20,...) in the Ref. No. column are shown in the exploded views.
8. Parts whose Ref. Nos. are the same are interchangeable as replacement parts. Any of these parts may be ordered and used as a replacement part.

11.1.2. Mechanical Replacement Notes

1. Section No. of parts shown in Exploded Views are indicated in the Remarks column.
2. Main Cam Gear is supplied as a Main Cam Gear Kit (Ref. No. 8) only. Main Cam Gear Kit consists of a Main Cam Gear and a Main Cam Push Nut. However, Main Cam Push Nut is available separately as a replacement part.
3. The Infrared Remote Control Unit (Ref. No. 123) replacement part is available as a complete assembly unit only. Do not try to

disassemble the Infrared Remote Control Unit. However, the battery cover is available separately as a replacement part.

4. Main Cam Push Nut (Ref. No. 414) is not reusable.
If removed, install a new one.

11.1.3. Electrical Replacement Notes

1. Unless otherwise specified;
All resistors are in Ω , K = 1,000 Ω , M = 1,000 k Ω .

2. Abbreviation

RTL:

Retention Time Limited

This indicates that the retention time is limited for this item. After the discontinuation of this item in production, it will no longer be available.

NR:

Non Repairable Board Ass'y

MGF CHIP:

Metal Glaze Film Chip

C CHIP:

Ceramic Chip

COMPLX CMP:

Complex Component

W FLMPRF:

Wirewound Flameproof

C.B.A.:

Circuit Board Assembly

P.C.B.:

Printed Circuit Board

E.S.D.:

Electrostatically Sensitive Devices

3. SERVICE OF CHIP PARTS

When servicing chip parts, please use a soldering iron of less than 30 W. Refer to "[IC, TRANSISTOR AND CHIP PART INFORMATION](#)" page.

4. When replacing 0 Ω resistor, a wire can be substituted for it.
5. When installing the IC2501 (AN3846SC) or Capstan Stator C.B.A., be sure to apply Silicon Grease (VFK1301). Refer to "Capstan Stator C.B.A." of MECHANISM SECTION in DISASSEMBLY/ASSEMBLY PROCEDURES.
6. Since the UHF/VHF TUNER/TV DEMODULATOR UNIT (Ref. No. 743) has already been pre-adjusted at the factory, do not try to adjust the UHF/VHF TUNER/TV DEMODULATOR UNIT. The UHF/VHF TUNER/TV DEMODULATOR UNIT replacement part is available as a complete assembly unit only.
7. EEPROM IC (IC6005), Main C.B.A. replacement note:
After replacing EEPROM IC (IC6005) or Main C.B.A., be sure to perform the "PG SHIFTER ADJUSTMENT" in ELECTRICAL ADJUSTMENT procedures.
8. The Capstan Stator C.B.A. (Ref. No. E30) as a service part is supplied with the Screw installed on it. Please note that there is no functional difference between the units with or without the Screw.

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B

11.2. MECHANICAL REPLACEMENT PARTS LISTS

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B

MECHANICAL REPLACEMENT PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	VBSS0033	FULL ERASE HEAD	1
2	VXKS0901	MOTOR BLOCK UNIT	1
3	LSDB0045	TENSION ARM BOSS	1
4	VXDS0212	CAPSTAN HOLDER UNIT	1
5	LSMD0209	OPENER PIECE	1
8	VVGS0009	MAIN CAM GEAR KIT	2
9	LSDR0006	S REEL TABLE	1
10	LSDR0007	T REEL TABLE	1
11	VEGS0457	CYLINDER UNIT	1
12	VEHS0596	AUDIO CONTROL/ERASE HEAD UNIT	1
14	LSDG0112	LIFT GEAR	1
16	VXDS0213	LOADING POST BASE-S UNIT	1
17	VXDS0214	LOADING POST BASE-T UNIT	1
18	VXLS1094	PINCH ARM UNIT	1
19	LSDG0110	INTERMEDIATE GEAR A	1
20	VXLS1101	P5 ARM UNIT	1
21	LSML0131	DRIVE RACK ARM	1
22	VXLS1127	TENSION CONTROL ARM UNIT	1
23	LSMX0129	OIL SEAL	1
24	LSMA0434	REGULATOR ANGLE	1
27	VXLS1130	T BRAKE ARM UNIT	1
29	VXLS1129	TENSION ARM UNIT	1
35	LSKA0012	RUBBER FOOT	4
38	LSMB0217	CASSETTE DOOR SPRING	4
40	LSMD0255	S-VHS DETECT PIECE	1
41	VXPS0389	CENTER CLUTCH UNIT	2
42	VMBS1151	CHANGING GEAR SPRING	2
43	LSDG0132	CHANGING GEAR	2
44	VXLS1133	IDLER ARM UNIT	2
45	VXPS0393	CAPSTAN ROTOR UNIT	2
46	LSMA0387	STOPPER ANGLE	2
47	LSMM0003	MAIN ROD	2
49	VXLS1099	S LOADING ARM UNIT	2
50	VXLS1098	T LOADING ARM UNIT	2
51	LSDG0134	REEL GEAR	2
52	LSDG0111	INTERMEDIATE GEAR B	2
53	LSMA0423	SUPPORT ANGLE	2
54	LSDV0008	CAPSTAN BELT SQUARE,RUBBER 2MM	2
55	VXPS0392	SUB ROTOR UNIT	2
56	VPFS0057	SHEET,POLYETHYLENE	5
57	VXSS0010	GROUNDING PLATE UNIT	1
58	VXLS1105	SS BRAKE ARM UNIT	2
59	LSMB0196	SS BRAKE SPRING	2
61	VXYS1347	CASSETTE UP ASS'Y	3
62	LSMA0352	TOP PLATE	3
64	LSMD0174	SIDE PLATE L	3
65	LSMD0173	SIDE PLATE R	3
66	LSMB0218	SUPPORT SPRING	3
67	LSML0096	OPENER LEVER	3
68	VXLS1111	DRIVE RACK UNIT	3
69	VXAS4423	HOLDER UNIT	3
70	VXLS1110	WIPER ARM UNIT	3
71	VYPS7091	FRONT PANEL ASS'Y	4
72	VYPS7097	CASSETTE DOOR-LID UNIT	4

Ref. No.	Part No.	Part Name & Description	Remarks
73	LSKM0626	TOP COVER	4
74	LSKU0015	BOTTOM PANEL	4
75	LSGP0198	REAR PANEL	4
76	LSSC0332	CHASSIS ANGLE	4
100	LSKF0369	BATTERY COVER (A)	5
100	LSKF0310	BATTERY COVER (B)	5
121	LSPG1107	PACKING CASE,PAPER (A)	5
121	LSPG1108	PACKING CASE,PAPER (B)	5
122	LSQF0370	FAN BAG (A)	5
122	LSQF0388	FAN BAG (B)	5
123	LSSQ0299	INFRARED REMOTE CONTROL UNIT (A)	5
123	LSSQ0270	INFRARED REMOTE CONTROL UNIT (B)	5
124	LSJA0372	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0274	VHF CONNECTING CABLE W/PLUG,0V	5
124	LSJA0328	VHF CONNECTING CABLE W/PLUG,0V	5
124	VJAS0212	VHF CONNECTING CABLE W/PLUG,0V	5
125	LSPN0169	FRONT CUSHION,STYROFOAM	5
126	LSPN0152	REAR CUSHION,STYROFOAM	5
129	VJAS0200	S-VIDEO CABLE W/PLUG,AC1VP-P	5
401	VHDS0475	SCREW,STEEL	1
410	VHDS0498	SCREW W/WASHER,STEEL	1
414	VHNS0070	MAIN CAM PUSH NUT,STEEL	2
422	XWGV2D5G	WASHER,NYLON	2
425	XTB3+12A	TAPPING SCREW,STEEL	4
430	XTV26+6FFZJ	TAPPING SCREW,STEEL	1
447	VHDS0310	SCREW,STEEL	4
460	XTN4+12A	TAPPING SCREW,STEEL	4
461	VHDS0460	SCREW,STEEL	4
471	XSN26+5	SCREW,STEEL	1
473	XYN26+C6	SCREW W/WASHER,STEEL	2
474	LSHD0056	TAPPING SCREW,STEEL	1
475	XTV26+5FJ	TAPPING SCREW,STEEL	2
477	XTN2+8J	TAPPING SCREW,STEEL	4
478	VHDS0495	SCREW,STEEL	1
482	XNG3	NUT,STEEL	4
483	XYN3+F10S	SCREW W/WASHER,STEEL	4
491	XYN2+J7	SCREW W/WASHER,STEEL	2
501	LSHD0074	SCREW W/WASHER,STEEL	4
502	LSHD0075	TAPPING SCREW,STEEL	4
711	LSSZ0004	INFRARED RECEIVER UNIT	4
716	LSSZ0001	LED DISPLAY PANEL	4
731(IC2505)	EZMPS300F12	MR HEAD	2
732(P2502)	LSJS0097	CONNECOR 12P	2
733	LSMA0385	BACK PLATE,STEEL	2
734	VMXS0575	LED SPACER	4
735	VGMS0611	LED HOLDER	4
741	LSJA0360	AC CORD W/PLUG,AC 125V	4 
741	LSJA0358	AC CORD W/PLUG,AC 125V	4 
741	LSJA0359	AC CORD W/PLUG,AC 125V	4 
741	LSJA0361	AC CORD W/PLUG,AC 125V	4 
743	ENG56717G1	TUNER,UHF/VHF NR	4
771	EYF52BC	FUSE HOLDER	4
773	VSCS1072	HEAT SINK	4

Ref. No.	Part No.	Part Name & Description	Remarks
E10	VEPS6074SA	MAIN C.B.A. (A)	4 RTL
E10	VEPS6074SB	MAIN C.B.A. (B)	4 RTL
E20	VEPS8057D	OPERATION C.B.A.	4 RTL
E30	VEMS0344	CAPSTAN STATOR C.B.A. NR	2
E60	VEPS0A87A	S-VHS JACK C.B.A.	4 RTL

SERVICE FIXTURES AND TOOLS

Ref. No.	Part No.	Part Name & Description	Remarks
	VFMS0003H6	VHS ALIGNMENT TAPE	
	VFKS0081	GREASE	
	VFK0329	POST ADJUSTMENT DRIVER	
	VFK1301	SILICON GREASE	
	VFK27	HEAD CLEANING STICK	
	VFK0330	H-POSITION ADJUSTMENT DRIVER	

11.3. ELECTRICAL REPLACEMENT PARTS LIST

COMPARISON CHART OF MODELS & MARKS

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B

PRINTED CIRCUIT BOARD ASSEMBLY

Ref. No.	Part No.	Part Name & Description	Remarks
E10	VEPS6074SA	MAIN C.B.A. (A)	E.S.D. RTL
E10	VEPS6074SB	MAIN C.B.A. (B)	E.S.D. RTL
E20	VEPS8057D	OPERATION C.B.A.	E.S.D. RTL
E30	VEMS0344	CAPSTAN STATOR C.B.A. NR	
E60	VEPS0A87A	S-VHS JACK C.B.A.	RTL

11.3.1. MAIN C.B.A.

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description	Remarks
IC1001	0N3131-R.KT	IC, LINEAR	⚠
IC1001	PS2501-1-X	IC, LINEAR	⚠
IC1001	0N3131-S.KT	IC, LINEAR	⚠
IC1002	TA76431AS	IC, LINEAR	
IC1002	TA76431ASTP6	IC, LINEAR	
IC2601	AN3808K	IC, LINEAR	
IC3001	HA118421BSNF	IC, LINEAR	
IC3101	NJM2235M-TE1	IC, LINEAR	
IC3201	TA8898AN	IC, LINEAR	
IC3401	TC90A45F-ELP	IC, LOGIC	E.S.D.
IC3701	AN3293S	IC, LINEAR	
IC3791	AN6308S	IC, LINEAR	
IC3801	AN3275SB-E1	IC, LINEAR	
IC4201	AN3663FBP-V	IC, LINEAR	
IC6001	MN101D07HPE	IC, 8BIT MICROCONTROLLER	E.S.D.
IC6002	RPI-303	PHOTO INTERRUPTER	
IC6003	RPI-303	PHOTO INTERRUPTER	
IC6004	PST3147NR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6004	RN5VS47CA-TR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6004	XC61CC4702MR	IC, CMOS STANDARD LOGIC	E.S.D.
IC6005	KS24C011CS	IC, 1K EEP ROM	E.S.D.
IC6005	AT24C01A10SI	IC, 1K EEP ROM	E.S.D.
IC6005	BR24C01AF-E2	IC, 1K EEP ROM	E.S.D.
IC6005	BR24C01AFWE2	IC, 1K EEP ROM	E.S.D.
IC6005	KS24C011IS	IC, 1K EEP ROM	E.S.D.
IC6005	M24C01-MN6	IC, 1K EEP ROM	E.S.D.
IC6301	PT6957E	IC, LOGIC	E.S.D.

TRANSISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
Q1001	2SC4559LP.KT	TRANSISTOR SI NPN	⚠
Q1001	2SC4130LF608	TRANSISTOR SI NPN	⚠
Q1002	2SD1458	TRANSISTOR SI NPN	
Q1002	2SD2259	TRANSISTOR SI NPN	
Q1051	2SD2159(T)	TRANSISTOR SI NPN	
Q1051	2SD1581(T)	TRANSISTOR SI NPN	
Q1052	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q1052	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q1053	2SD235800A	TRANSISTOR SI NPN CHIP	
Q1053	2SD2097TV2R	TRANSISTOR SI NPN CHIP	
Q1080	2SB1398(Q)	TRANSISTOR SI NPN CHIP	
Q1081	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q1081	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q1082	2SB1398(Q)	TRANSISTOR SI NPN CHIP	
Q1083	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q1083	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3004	2SD601A	TRANSISTOR SI NPN CHIP	
Q3004	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3006	UN2213	TRANSISTOR SI NPN CHIP	
Q3006	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3007	UN2213	TRANSISTOR SI NPN CHIP	
Q3007	DTC144EKA146	TRANSISTOR SI NPN CHIP	

Ref. No.	Part No.	Part Name & Description	Remarks
Q3091	2SD601A	TRANSISTOR SI NPN CHIP	
Q3091	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3101	2SB709A	TRANSISTOR SI PNP CHIP	
Q3101	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3103	2SB709A	TRANSISTOR SI PNP CHIP	
Q3103	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3151	2SB709A	TRANSISTOR SI PNP CHIP	
Q3151	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3152	2SB709A	TRANSISTOR SI PNP CHIP	
Q3152	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3221	UN2213	TRANSISTOR SI NPN CHIP	
Q3221	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3222	UN2113	TRANSISTOR SI PNP CHIP	
Q3222	DTA144EKA146	TRANSISTOR SI PNP CHIP	
Q3291	UN2213	TRANSISTOR SI NPN CHIP	
Q3291	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3292	UN2213	TRANSISTOR SI NPN CHIP	
Q3292	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3371	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q3372	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q3373	2SD601A	TRANSISTOR SI NPN CHIP	
Q3373	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3374	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q3375	2SD601A	TRANSISTOR SI NPN CHIP	
Q3375	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3376	2SD601A	TRANSISTOR SI NPN CHIP	
Q3376	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3377	2SD601A	TRANSISTOR SI NPN CHIP	
Q3377	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3378	2SB709A	TRANSISTOR SI PNP CHIP	
Q3378	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3401	2SD601A	TRANSISTOR SI NPN CHIP	
Q3401	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3402	2SD601A	TRANSISTOR SI NPN CHIP	
Q3402	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3403	2SD601A	TRANSISTOR SI NPN CHIP	
Q3403	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3404	2SB709A	TRANSISTOR SI PNP CHIP	
Q3404	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3405	2SD601A	TRANSISTOR SI NPN CHIP	
Q3405	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3501	UN2213	TRANSISTOR SI NPN CHIP	
Q3501	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3502	UN2213	TRANSISTOR SI NPN CHIP	
Q3502	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3503	UN2213	TRANSISTOR SI NPN CHIP	
Q3503	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3504	UN2213	TRANSISTOR SI NPN CHIP	
Q3504	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3701	2SB709A	TRANSISTOR SI PNP CHIP	
Q3701	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3702	2SB709A	TRANSISTOR SI PNP CHIP	
Q3702	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q3751	UN2113	TRANSISTOR SI PNP CHIP	

Ref. No.	Part No.	Part Name & Description	Remarks
Q3751	DTA144EKA146	TRANSISTOR SI PNP CHIP	
Q3752	2SD601A	TRANSISTOR SI NPN CHIP	
Q3752	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3753	2SD601A	TRANSISTOR SI NPN CHIP	
Q3753	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q3756	2SC2404(CD)	TRANSISTOR SI NPN CHIP	
Q3756	2SC4973(CD)	TRANSISTOR SI NPN CHIP	
Q3791	UN2213	TRANSISTOR SI NPN CHIP	
Q3791	DTC144EKA146	TRANSISTOR SI NPN CHIP	
Q3801	2SD1819A	TRANSISTOR SI NPN	
Q3801	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q3871	2SB709A	TRANSISTOR SI PNP CHIP	
Q3871	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q4001	2SB1218ARS	TRANSISTOR SI PNP CHIP	
Q4001	2SA1576A106R	TRANSISTOR SI PNP CHIP	
Q4002	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q4003	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q4101	2SD601A(RS)	TRANSISTOR SI NPN CHIP	
Q4101	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q6001	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6001	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6002	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q6003	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6003	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6005	2SB709A(RS)	TRANSISTOR SI PNP CHIP	
Q6005	2SA1037K146R	TRANSISTOR SI PNP CHIP	
Q6006	2SD1819ARS	TRANSISTOR SI NPN CHIP	
Q6006	2SC4081T106R	TRANSISTOR SI NPN CHIP	
Q6007	UN511L	TRANSISTOR SI PNP CHIP	
Q6007	DTA143EUA106	TRANSISTOR SI PNP CHIP	
Q6009	VEKS5707	PHOTO SENSOR UNIT	
Q6010	VEKS5707	PHOTO SENSOR UNIT	
Q6301	IMT17-T110	TRANSISTOR COMPLX CMP SI PNP CHIP	
Q6302	IMT17-T110	TRANSISTOR COMPLX CMP SI PNP CHIP	
Q6303	2SB709A	TRANSISTOR SI PNP CHIP	
Q6303	2SA1037K146R	TRANSISTOR SI PNP CHIP	

DIODES

Ref. No.	Part No.	Part Name & Description	Remarks
D1001	DB105G	DIODE SI	
D1001	S1WBA60-4062	DIODE SI	
D1002	ERA18-04	DIODE SI	
D1002	EG01	DIODE SI	
D1003	ERA18-04	DIODE SI	
D1003	EG01	DIODE SI	
D1005	ERA18-04	DIODE SI	
D1005	EG01	DIODE SI	
D1006	ERC30-01L3	DIODE SI	
D1006	RU3YXLFC1	DIODE SI	
D1008	ERB81-004V1	DIODE SI	
D1008	RK14V1	DIODE SI	
D1009	D1FS4	DIODE SI	
D1009	EC10QS03L	DIODE SI	
D1009	EP10QY03	DIODE SI	
D1009	SFPJ-53	DIODE SI	
D1009	U1FWJ44N	DIODE SI	
D1010	MA165	DIODE SI	
D1010	1SS119	DIODE SI	
D1010	1SS133T	DIODE SI	
D1015	MA2180LA	DIODE ZENER 18V	
D1015	1N4746A-T	DIODE ZENER 18V	
D1015	1N4746ARL	DIODE ZENER 18V	
D1016	MA165	DIODE SI	
D1016	1SS119	DIODE SI	
D1016	1SS133T	DIODE SI	
D1051	MA4110N-H	DIODE ZENER 11V	
D1080	EK19V1	DIODE SI	
D1081	MA2240LA	DIODE ZENER CHIP 24V	
D1083	ERA15-01V5	DIODE SI	
D1084	ERA15-01V5	DIODE SI	
D1085	ERA15-01V5	DIODE SI	
D1086	ERA15-01V5	DIODE SI	
D1087	ERA15-01V5	DIODE SI	
D1088	ERA15-01V5	DIODE SI	
D3006	MA4051-M	DIODE ZENER 5.1V	
D3006	04AZ5.1ZTPA7	DIODE ZENER 5.1V	
D3007	MA4051-M	DIODE ZENER 5.1V	
D3007	04AZ5.1ZTPA7	DIODE ZENER 5.1V	
D3221	MA165	DIODE SI	
D3221	1SS119	DIODE SI	
D3221	1SS133T	DIODE SI	
D3222	MA165	DIODE SI	
D3222	1SS119	DIODE SI	
D3222	1SS133T	DIODE SI	
D3371	MA111	DIODE SI CHIP	
D3901	MA165	DIODE SI	
D3901	1SS119	DIODE SI	
D3901	1SS133T	DIODE SI	
D3902	MA165	DIODE SI	
D3902	1SS119	DIODE SI	
D3902	1SS133T	DIODE SI	
D4209	MA165	DIODE SI	

Ref. No.	Part No.	Part Name & Description	Remarks
D4209	1SS119	DIODE SI	
D4209	1SS133T	DIODE SI	
D4210	MA165	DIODE SI	
D4210	1SS119	DIODE SI	
D4210	1SS133T	DIODE SI	
D6001	VEKS5708	SENSOR LED UNIT	
D6003	MA165	DIODE SI	
D6003	1SS119	DIODE SI	
D6003	1SS133T	DIODE SI	
D6325	MA165	DIODE SI	
D6325	1SS119	DIODE SI	
D6325	1SS133T	DIODE SI	
D6326	MA165	DIODE SI	
D6326	1SS119	DIODE SI	
D6326	1SS133T	DIODE SI	

RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R1001	VRESC2TK275	CARBON 1/2W 2.7M	
R1001	VRESC2TK275C	CARBON 1/2W 2.7M	
R1001	VRESC2TK275T	CARBON 1/2W 2.7M	
R1003	VRESE2TJ154T	CARBON 1/2W 150K	
R1004	ERG2SJ333H	METAL OXIDE 2W 33K	
R1005	ERG1SJ680P	METAL OXIDE 1W 68	
R1006	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1007	ERDS2TJ101	CARBON 1/4W 100	
R1008	ERDS2TJ392	CARBON 1/4W 3.9K	
R1010	ERD25FJ100P	CARBON 1/4W 10	
R1010	VRESF4FJ100P	CARBON 1/4W 10	
R1014	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R1015	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R1016	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1017	VRJSD6D2431V	MGF CHIP1/10W 2.43K	
R1018	VRJSD6D2201V	MGF CHIP1/10W 2.2K	
R1019	ERDS2T0	CARBON 1/4W 0	
R1025	VRESE2TJ150T	CARBON 1/2W 15	
R1051	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R1052	ERDS2TJ153	CARBON 1/4W 15K	
R1053	ERDS2TJ153	CARBON 1/4W 15K	
R1057	ERDS2TJ331	CARBON 1/4W 330	
R1058	ERDS2TJ104	CARBON 1/4W 100K	
R1068	ERDS2T0	CARBON 1/4W 0	
R1080	ERDS2TJ103	CARBON 1/4W 10K	
R1081	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R1083	VRESE2TJ122T	CARBON 1/2W 1.2K	
R1084	VRESE2TJ122T	CARBON 1/2W 1.2K	
R1085	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R1086	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R2601	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2602	ERJ6GEYJ330V	MGF CHIP 1/10W 33	
R2603	ERJ6GEYJ330V	MGF CHIP 1/10W 33	

Ref. No.	Part No.	Part Name & Description	Remarks
R2604	ERDS2TJ1R0	CARBON 1/4W 1	
R2605	ERDS2TJ1R2	CARBON 1/4W 1.2	
R2606	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3001	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3003	ERJ6GEYJ273V	MGF CHIP 1/10W 27K	
R3004	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3006	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R3009	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R3010	ERJ6GEYJ621V	MGF CHIP1/10W 620	
R3011	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3026	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R3030	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R3031	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R3033	ERJ6GEYJ335V	MGF CHIP 1/10W 3.3M	
R3035	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3036	ERJ6GEYJ474V	MGF CHIP 1/10W 470K	
R3037	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R3043	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R3071	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3072	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3091	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R3092	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3094	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3101	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3102	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3103	ERDS2TJ561	CARBON 1/4W 560	
R3104	ERDS2TJ680T	CARBON 1/4W 68	
R3105	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R3151	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3152	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3153	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3154	ERDS2TJ561	CARBON 1/4W 560	
R3155	ERJ6GEYJ680V	MGF CHIP 1/10W 68	
R3156	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3157	ERDS2TJ561	CARBON 1/4W 560	
R3158	ERJ6GEYJ750V	MGF CHIP 1/10W 75	
R3159	ERDS2TJ103	CARBON 1/4W 10K	
R3201	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R3221	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R3222	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R3291	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3292	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R3301	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3302	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3305	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3371	ERJ6GEYJ392V	MGF CHIP 1/10W 3.9K	
R3372	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3373	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R3374	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3375	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R3376	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3377	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R3378	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3379	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	

Ref. No.	Part No.	Part Name & Description	Remarks
R3380	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3381	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3401	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3402	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3403	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3404	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3405	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3409	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3410	ERJ6GEYJ471V	MGF CHIP 1/10W 470	
R3411	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3413	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R3414	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R3415	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3416	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R3417	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3418	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R3505	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R3506	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R3507	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R3508	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R3701	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3702	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R3703	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3704	ERJ6GEYJ471V	MGF CHIP 1/10W 470	
R3705	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3706	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R3707	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R3708	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R3709	ERJ6GEYJ242V	MGF CHIP 1/10W 2.4K	
R3710	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R3711	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3751	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R3752	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R3753	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3754	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R3755	ERJ6GEYJ123V	MGF CHIP 1/10W 12K	
R3757	ERJ6GEYJ681V	MGF CHIP 1/10W 680	
R3758	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R3759	ERJ6GEYJ821V	MGF CHIP 1/10W 820	
R3760	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R3770	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R3791	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R3803	ERJ6GEYG473V	MGF CHIP 1/10W 47K	
R3807	ERJ6GEYJ393V	MGF CHIP 1/10W 39K	
R3810	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R3811	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R3812	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R3813	ERJ6GEYJ563V	MGF CHIP 1/10W 56K	
R3823	ERJ6GEYJ471V	MGF CHIP 1/10W 470	
R3824	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3825	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R3826	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R3871	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R3872	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	

Ref. No.	Part No.	Part Name & Description	Remarks
R4001	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4002	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4003	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R4004	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R4005	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R4006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4007	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4008	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R4009	ERJ6GEYJ682V	MGF CHIP 1/10W 6.8K	
R4010	ERJ6GEYJ334V	MGF CHIP 1/10W 330K	
R4011	ERJ6GEYJ471V	MGF CHIP 1/10W 470	
R4012	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
R4101	ERJ6GEYJ124V	MGF CHIP 1/10W 120K	
R4102	ERJ6GEYJ273V	MGF CHIP 1/10W 27K	
R4103	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R4201	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4202	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4203	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4204	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4206	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R4207	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4208	ERJ6GEYJ822V	MGF CHIP 1/10W 8.2K	
R4209	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4210	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4213	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4214	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R4218	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R4219	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R4221	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4222	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4223	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R4224	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R4225	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4226	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R4230	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R4453	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R4455	ERJ6GEYJ152V	MGF CHIP 1/10W 1.5K	
R6001	ERDS2TJ101	CARBON 1/4W 100	
R6003	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6004	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6005	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6006	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6007	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6009	ERJ6GEYJ563V	MGF CHIP 1/10W 56K	
R6010	ERJ6GEYJ182V	MGF CHIP 1/10W 1.8K	
R6012	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6016	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6019	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6021	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6022	ERJ6GEYJ333V	MGF CHIP 1/10W 33K	
R6024	ERJ6GEYJ562V	MGF CHIP 1/10W 5.6K	
R6025	ERJ6GEYJ332V	MGF CHIP 1/10W 3.3K	
R6026	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	

Ref. No.	Part No.	Part Name & Description	Remarks
R6027	ERJ6GEYJ101V	MGF CHIP 1/10W 100	
R6031	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6033	ERDS2TJ681	CARBON 1/4W 680	
R6034	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6035	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6036	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6037	ERJ6GEYJ391V	MGF CHIP 1/10W 390	
R6038	ERDS2TJ560T	CARBON 1/4W 56	
R6039	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6045	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6047	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6048	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6049	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6050	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6051	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6052	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6057	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6059	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6060	ERJ6GEYJ475V	MGF CHIP 1/10W 4.7M	
R6062	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6063	ERJ6GEYJ153V	MGF CHIP 1/10W 15K	
R6066	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6069	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6070	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6071	ERJ6GEYJ222V	MGF CHIP 1/10W 2.2K	
R6073	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6074	ERDS2TJ272	CARBON 1/4W 2.7K	
R6078	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6079	ERJ6GEYJ221V	MGF CHIP 1/10W 220	
R6080	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6081	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6082	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6085	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6086	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6087	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6088	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6089	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6090	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6091	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6098	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6101	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6102	ERJ6GEYJ561V	MGF CHIP 1/10W 560	
R6109	ERJ6GEYJ183V	MGF CHIP 1/10W 18K	
R6110	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6115	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6116	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6202	ERJ6GEYJ274V	MGF CHIP 1/10W 270K	
R6203	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R6204	ERJ6GEYJ184V	MGF CHIP 1/10W 180K	
R6205	ERJ6GEYJ473V	MGF CHIP 1/10W 47K	
R6224	ERJ6GEYJ472V	MGF CHIP 1/10W 4.7K	
R6228	ERJ6GEYJ122V	MGF CHIP 1/10W 1.2K	
R6231	ERJ6GEYJ225V	MGF CHIP 1/10W 2.2M	
R6346	ERDS2TJ470	CARBON 1/4W 47	

Ref. No.	Part No.	Part Name & Description	Remarks
R6361	ERJ8GEYJ4R7V	MGF CHIP 1/8W 4.7	
R6364	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6365	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6366	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6367	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6368	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6369	ERJ6GEYJ104V	MGF CHIP 1/10W 100K	
R6370	ERJ6GEYJ121V	MGF CHIP 1/10W 120	
R6371	ERJ6GEYJ223V	MGF CHIP 1/10W 22K	
R6373	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6374	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6375	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6376	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6377	ERJ6GEYJ272V	MGF CHIP 1/10W 2.7K	
R6378	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6379	ERDS2TJ102	CARBON 1/4W 1K	
R6380	ERDS2TJ102	CARBON 1/4W 1K	
R6381	ERDS2TJ102	CARBON 1/4W 1K	
R6382	ERDS2TJ102	CARBON 1/4W 1K	
R6521	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	
R7004	ERJ6GEYJ103V	MGF CHIP 1/10W 10K	

CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C1001	ECKATS103MF	CERAMIC 250V 0.01UF	
C1001	ECKETS103MF	CERAMIC 125V 0.01UF	
C1001	VCKST3G103MY	CERAMIC 250V 0.01UF	
C1001	VCKSU3D103MY	CERAMIC 125V 0.01UF	
C1002	ECKATS332ME8	CERAMIC 250V 3300PF	
C1002	ECKDNB332ME8	CERAMIC 125V 3300PF	
C1002	ECKETS332ME8	CERAMIC 125V 3300PF	
C1002	VCKST3G332MX	CERAMIC 250V 3300PF	
C1002	VCKSU3D332MX	CERAMIC 125V 3300PF	
C1003	ECKATS332ME8	CERAMIC 250V 3300PF	
C1003	ECKDNB332ME8	CERAMIC 125V 3300PF	
C1003	ECKETS332ME8	CERAMIC 125V 3300PF	
C1003	VCKST3G332MX	CERAMIC 250V 3300PF	
C1003	VCKSU3D332MX	CERAMIC 125V 3300PF	
C1004	ECEA2DU121YE	ELECTROLYTIC 200V 120UF	
C1004	VCESAN2D121E	ELECTROLYTIC 200V 120UF	
C1004	VCESR2D121XE	ELECTROLYTIC 200V 120UF	
C1005	ECA2DHG4R7B	ELECTROLYTIC 200V 4.7UF	
C1006	ECKR2H221KB5	CERAMIC 500V 220PF	
C1007	ECUV1C224KBN	C CHIP 16V 0.22UF	
C1009	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1010	ECUV1H101JCN	C CHIP 50V 100PF	
C1011	ECEA1HGE470I	ELECTROLYTIC 50V 47UF	
C1012	ECEA1PEE331	ELECTROLYTIC 18V 330UF	
C1013	ECA1EM331B	ELECTROLYTIC 25V 330UF	
C1016	ECEA1PEE102B	ELECTROLYTIC 18V 1000UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C1017	ECEA0JFE102X	ELECTROLYTIC 6.3V 1000UF	
C1018	ECUV1E104KBN	C CHIP 25V 0.1UF	
C1019	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1020	ECA0JM471B	ELECTROLYTIC 6.3V 470UF	
C1027	ECKATS103MF	CERAMIC 250V 0.01UF	
C1027	VCKSU3D103MY	CERAMIC 125V 0.01UF	
C1028	ECKATS103MF	CERAMIC 250V 0.01UF	
C1029	ECUV1H101JCN	C CHIP 50V 100PF	
C1030	VCYSBRE183KX	CERAMIC 25V 0.018UF	
C1032	ECEA0JKA221	ELECTROLYTIC 6.3V 220UF	
C1051	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C1052	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C1058	ECEA0JEE101	ELECTROLYTIC 6.3V 100UF	
C1059	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C1080	EEUFD1V331LB	ELECTROLYTIC 35V 330UF	
C2601	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C2602	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C2603	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C2604	ECUV1C104KBN	C CHIP 16V 0.1UF	
C2605	ECUV1C104KBN	C CHIP 16V 0.1UF	
C2606	ECUV1C104KBN	C CHIP 16V 0.1UF	
C2607	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2608	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2609	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2610	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2611	ECUV1H103KBN	C CHIP 50V 0.01UF	
C2612	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3002	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3005	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3007	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3008	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3009	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF	
C3010	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3011	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3012	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3013	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3014	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3016	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF	
C3017	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3018	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3019	ECUV1H070CCN	C CHIP 50V 7PF	
C3020	ECUV1H223ZFN	C CHIP 50V 0.022UF	
C3021	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C3022	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3023	ECUV1H223ZFN	C CHIP 50V 0.022UF	
C3024	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3025	ECUV1H472KBN	C CHIP 50V 4700PF	
C3026	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3027	ECUV1E333KBN	C CHIP 25V 0.033UF	
C3029	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C3031	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3033	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3034	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3035	ECUV1H103ZFN	C CHIP 50V 0.01UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C3036	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3037	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3038	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3039	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3041	ECUV1H151JCN	C CHIP 50V 150PF	
C3044	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3045	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3046	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3048	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3049	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3050	ECEA1EKA470I	ELECTROLYTIC 25V 47UF	
C3051	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3091	ECUV1H223ZFN	C CHIP 50V 0.022UF	
C3093	ECUV1H820JCN	C CHIP 50V 82PF	
C3094	ECUV1H181JCN	C CHIP 50V 180PF	
C3095	ECUV1H473ZFN	C CHIP 50V 0.047UF	
C3101	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3102	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3103	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3104	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3105	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3106	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C3107	ECUV1H101JCN	C CHIP 50V 100PF	
C3153	ECA0JM471	ELECTROLYTIC 6.3V 470UF	
C3155	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3157	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3201	ECEA1HKA4R7	ELECTROLYTIC 50V 4.7UF	
C3202	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3203	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3204	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3205	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3206	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3207	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3208	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3209	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3210	ECUV1H472KBN	C CHIP 50V 4700PF	
C3211	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3212	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3213	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3214	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3215	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3216	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3217	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3291	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3292	ECUV1H270JCN	C CHIP 50V 27PF	
C3302	ECUV1C474ZFN	C CHIP 16V 0.47UF	
C3303	ECUV1H121JCN	C CHIP 50V 120PF	
C3306	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3308	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3351	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3371	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3372	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3373	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3401	ECEA1HKA010	ELECTROLYTIC 50V 1UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C3402	ECUV1H270JCN	C CHIP 50V 27PF	
C3403	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3405	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3406	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
C3408	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3417	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3418	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3419	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3420	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3421	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3422	ECUV1H181JCN	C CHIP 50V 180PF	
C3423	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3424	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3425	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3426	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3427	ECEA1HKAR47	ELECTROLYTIC 50V 0.47UF	
C3428	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3429	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3501	ECUV1H101JCN	C CHIP 50V 100PF	
C3502	ECUV1H560JCN	C CHIP 50V 56PF	
C3503	ECUV1H220JCN	C CHIP 50V 22PF	
C3504	ECUV1H180JCN	C CHIP 50V 18PF	
C3701	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3702	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3703	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C3704	ECUV1H271KBN	C CHIP 50V 270PF	
C3705	ECUV1H820JCN	C CHIP 50V 82PF	
C3706	ECUV1H271JCN	C CHIP 50V 270PF	
C3709	ECUV1H221KBN	C CHIP 50V 220PF	
C3710	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3711	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3712	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C3713	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C3728	ECUV1H271KBN	C CHIP 50V 270PF	
C3791	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C3793	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C3794	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C3795	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3801	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C3802	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3803	ECUV1H332KBN	C CHIP 50V 3300PF	
C3804	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3805	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C3806	ECUV1H392KBN	C CHIP 50V 3900PF	
C3807	ECUV1H103KBN	C CHIP 50V 0.01UF	
C3808	ECUV1E104KBN	C CHIP 25V 0.1UF	
C3811	ECUV1H103KBN	C CHIP 50V 0.01UF	
C3812	ECUV1H102KBN	C CHIP 50V 1000PF	
C3815	ECUV1E104KBN	C CHIP 25V 0.1UF	
C3816	ECUV1E154KBN	C CHIP 25V 0.15UF	
C3817	ECUV1H103KBN	C CHIP 50V 0.01UF	
C3818	ECUV1H103KBN	C CHIP 50V 0.01UF	
C3819	ECUV1H103KBN	C CHIP 50V 0.01UF	
C3820	ECUV1E104ZFN	C CHIP 25V 0.1UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C3821	ECUV1H390JCN	C CHIP 50V 39PF	
C3822	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C3825	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C3826	ECUV1C474ZFN	C CHIP 16V 0.47UF	
C3828	ECUV1H101JCN	C CHIP 50V 100PF	
C3830	ECUV1E563KBN	C CHIP 25V 0.056UF	
C3851	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3852	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3853	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3854	ECUV1H104ZFN	C CHIP 50V 0.1UF	
C3855	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C3856	ECUV1H270JCN	C CHIP 50V 27PF	
C4001	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4002	ECUV1H152KBN	C CHIP 50V 1500PF	
C4003	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4004	ECUV1H222KBN	C CHIP 50V 2200PF	
C4005	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4006	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4007	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4008	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4011	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C4012	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4013	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4015	ECUV1H682KBN	C CHIP 50V 6800PF	
C4101	ECUV1H221JCN	C CHIP 50V 220PF	
C4102	ECQB1562JF	POLYESTER 100V 5600PF	
C4103	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4104	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4105	ECEA1CKA220	ELECTROLYTIC 16V 22UF	
C4201	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C4202	ECEA1EKA4R7	ELECTROLYTIC 25V 4.7UF	
C4203	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF	
C4204	ECEA0JKA330	ELECTROLYTIC 6.3V 33UF	
C4205	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4206	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4207	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4208	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4209	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4210	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4211	ECUV1H153KBN	C CHIP 50V 0.015UF	
C4212	ECUV1H153KBN	C CHIP 50V 0.015UF	
C4213	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4214	ECEA1CKA470	ELECTROLYTIC 16V 47UF	
C4215	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C4216	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4217	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C4218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4219	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4227	ECUV1C224ZFN	C CHIP 16V 0.22UF	
C4229	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C4230	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4231	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C4237	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
C4451	ECUV1H103KBN	C CHIP 50V 0.01UF	

Ref. No.	Part No.	Part Name & Description	Remarks
C4452	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4455	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4456	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4458	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C4459	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C4901	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4902	ECEA1HKA2R2	ELECTROLYTIC 50V 2.2UF	
C4903	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF	
C4904	ECEA1HKA3R3	ELECTROLYTIC 50V 3.3UF	
C4905	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C4906	ECEA1HKA010	ELECTROLYTIC 50V 1UF	
C4911	ECUV1E223KBN	C CHIP 25V 0.022UF	
C4912	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4913	ECUV1H103KBN	C CHIP 50V 0.01UF	
C4915	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C4916	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C4917	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4918	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4919	ECUV1E104KBN	C CHIP 25V 0.1UF	
C4920	ECUV1E223KBN	C CHIP 25V 0.022UF	
C4921	ERJ6GEY0R00V	MGF CHIP 1/10W 0	
C6001	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6003	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6005	ECUV1H150JCN	C CHIP 50V 15PF	
C6006	ECUV1H100CCN	C CHIP 50V 10PF	
C6011	ECUV1H101JCN	C CHIP 50V 100PF	
C6016	ECEA0JKA331	ELECTROLYTIC 6.3V 330UF	
C6019	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6021	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C6024	ECUV1H101JCN	C CHIP 50V 100PF	
C6026	ECUV1H102KBN	C CHIP 50V 1000PF	
C6033	ECUV1H104ZFN	C CHIP 50V 0.1UF	
C6201	ECUV1H332KBN	C CHIP 50V 3300PF	
C6203	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6208	ECUV1C104KBN	C CHIP 16V 0.1UF	
C6214	ECUV1H102KBN	C CHIP 50V 1000PF	
C6216	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6217	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6218	ECEA1CKA100	ELECTROLYTIC 16V 10UF	
C6221	ECEA0JKA220	ELECTROLYTIC 6.3V 22UF	
C6223	ECUV1H103KBN	C CHIP 50V 0.01UF	
C6224	ECEA0JKA331	ELECTROLYTIC 6.3V 330UF	
C6228	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6231	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6305	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C6306	ECEA0JKA331	ELECTROLYTIC 6.3V 330UF	
C6307	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C6320	VCESAM0J331I	ELECTROLYTIC 6.3V 330UF	
C6321	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C7001	ECEA0JKA101	ELECTROLYTIC 6.3V 100UF	
C7010	ECUV1H102KBN	C CHIP 50V 1000PF	

FILTERS

Ref. No.	Part No.	Part Name & Description	Remarks
FL3701	LSLF0054	DELAY LINE FILTER	

COILS

Ref. No.	Part No.	Part Name & Description	Remarks
L1001	ELF15N005A	LINE FILTER 0.5A 18MH	
L1001	LSLQ0287	LINE FILTER 0.5A 18MH	
L1001	VLQS0166	LINE FILTER 0.5A 18MH	
L1001	VLQS0167	LINE FILTER 0.5A 18MH	
L1001	VLQS0170	LINE FILTER 0.6A 18MH	
L1002	VLQSAB7D220K	COIL 22UH	
L1003	VLQSAB7D100K	COIL 10UH	
L1006	VLPS0083	FILTER	
L3003	VLQSAC3R120J	COIL 12UH	
L3004	ELESN101KA	COIL 100UH	
L3006	ELESN101KA	COIL 100UH	
L3007	ELESN560KA	COIL 56UH	
L3008	ELESN101KA	COIL 100UH	
L3009	VLQSAB7D220K	COIL 22UH	
L3092	ELESN560KA	COIL 56UH	
L3201	ELESN101KA	COIL 100UH	
L3202	ELESN680KA	COIL 68UH	
L3291	ELESN390KA	COIL 39UH	
L3352	ELESN101KA	COIL 100UH	
L3401	ELEXT120KE04	COIL 12UH	
L3403	ELESN101KA	COIL 100UH	
L3404	ELESN101KA	COIL 100UH	
L3501	ELESN470KA	COIL 47UH	
L3502	ELESN470KA	COIL 47UH	
L3503	ELESN470KA	COIL 47UH	
L3504	ELESN470KA	COIL 47UH	
L3701	ELESN101KA	COIL 100UH	
L3770	VLQSH02R120K	COIL 12UH	
L3801	ELESN101KA	COIL 100UH	
L3802	ELESN470KA	COIL 47UH	
L4002	ELELN153KA	COIL 15MH	
L4101	ELESN101KA	COIL 100UH	
L4201	ELESN101KA	COIL 100UH	
L4451	ELESN101KA	COIL 100UH	
L6002	ELEXT101KE04	COIL 100UH	
L6301	ELESN101KA	COIL 100UH	
L6302	ELESN470KA	COIL 47UH	
L6303	ERDS2TJ3R3	CARBON 1/4W 3.3	
L7003	VLQSH02R101K	COIL 100UH	

CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name & Description	Remarks
X3001	VSXS0812	CRYSTAL OSCILLATOR	
X6001	VSXS0232-TB	CRYSTAL OSCILLATOR	

PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P3150	VJSS0340	CONNECTOR 10P	
P3502	LSEK0407	SHIELD PLATE UNIT	
P3551	LSJWM9N050LL	CONNECTOR CABLE W/PLUG,DC 9V	
P4001	VJSS0888	FE CONNECTOR 2P	
P4002	LSJWM6N130LL	CONNECTOR CABLE W/PLUG,DC 9V	
P6201	LSJP0089	CONNECTOR 12P	
P6202	LSJWM8N045LL	CONNECTOR CABLE W/PLUG,DC 9V	
P6320	VJPS0885	CONNECTOR 20P	

SWITCHES

Ref. No.	Part No.	Part Name & Description	Remarks
SW6001	LSSH0002	SWITCH LEAF SWITCH-SAFETY TAB	
SW6002	LSSS0012	MODE SELECT SWITCH	
SW6003	ESE11SV1	S-VHS DETECT SWITCH	
SW6306	EVQ11A09K	PUSH SWITCH	
SW6313	EVQ11A09K	PUSH SWITCH	
SW6314	EVQ11A09K	PUSH SWITCH	
SW6315	EVQ11A09K	PUSH SWITCH	
SW6316	EVQ11A09K	PUSH SWITCH	

FUSE & PROTECTOR

Ref. No.	Part No.	Part Name & Description	Remarks
F1001	VSFS0003A16	FUSE 125V 1.6A	⚠
F1001	VSFS0032B16	FUSE 125V 1.6A	⚠
F1001	XBA1C16NU100	FUSE 125V 1.6A	⚠
PR1001	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1001	ICP-N38-TP1	IC PROTECTOR 1.5A	⚠
PR1001	LSSF009A25E	IC PROTECTOR 1.5A	⚠
PR1002	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1002	ICP-N38-TP1	IC PROTECTOR 1.5A	⚠
PR1002	LSSF009A25E	IC PROTECTOR 1.5A	⚠
PR1080	UNH000600A	IC PROTECTOR 1.5A	⚠
PR1080	ICP-N38-TP1	IC PROTECTOR 1.5A	⚠
PR1080	LSSF009A25E	IC PROTECTOR 1.5A	⚠

TRANSFORMER

Ref. No.	Part No.	Part Name & Description	Remarks
T1001	LSTP0098	TRANSFORMER	⚠
T1001	ETS28AD2X5NC	TRANSFORMER	⚠
T4101	EIQ7QF018Q	OSC TRANSFORMER	

JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK3001	LSJH0029	AUDIO/VIDEO JACK SOCKET	

MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
482	XNG3	NUT,STEEL	
483	XYN3+F10S	SCREW W/WASHER,STEEL	
711	LSSZ0004	INFRARED RECEIVER UNIT	
716	LSSZ0001	LED DISPLAY PANEL	
741	LSJA0360	AC CORD W/PLUG,AC 125V	
741	LSJA0358	AC CORD W/PLUG,AC 125V	
741	LSJA0359	AC CORD W/PLUG,AC 125V	
741	LSJA0361	AC CORD W/PLUG,AC 125V	
743	ENG56717G1	TUNER,UHF/VHF NR	
771	EYF52BC	FUSE HOLDER	
773	VSCS1072	HEAT SINK	

11.3.2. OPERATION C.B.A.

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description	Remarks
IC6401	D17216GT-750	IC, 4BIT MICROCONTROLLER	E.S.D.
IC6403	MN13821-R	IC, LOGIC	E.S.D.
IC6403	MN12821-R	IC, LOGIC	E.S.D.

TRANSISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
Q6380	2SD601A	TRANSISTOR SI NPN CHIP	
Q6380	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q6381	2SD601A	TRANSISTOR SI NPN CHIP	
Q6381	2SC2412K146R	TRANSISTOR SI NPN CHIP	
Q6401	2SD246000A	TRANSISTOR SI NPN CHIP	
Q6401	2SD2191TL2	TRANSISTOR SI NPN	

DIODES

Ref. No.	Part No.	Part Name & Description	Remarks
D6380	SLP313C81HAB	LED GREEN	
D6381	SLP313C81HAB	LED GREEN	
D6401	LN66ALKT	IR LED	
D6402	LN66ALKT	IR LED	
D6403	LN66ALKT	IR LED	
D7801	MA4051-M	DIODE ZENER 5.1V	
D7801	04AZ5.1ZTPA7	DIODE ZENER 5.1V	
D7802	MA4051-M	DIODE ZENER 5.1V	
D7802	04AZ5.1ZTPA7	DIODE ZENER 5.1V	

RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R6380	ERDS2TJ221	CARBON 1/4W 220	
R6381	ERDS2TJ222T	CARBON 1/4W 2.2K	
R6383	ERDS2TJ221	CARBON 1/4W 220	
R6384	ERDS2TJ222T	CARBON 1/4W 2.2K	
R6401	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6402	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6403	ERDS2TJ220	CARBON 1/4W 22	
R6404	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R6405	ERJ6GEYJ102V	MGF CHIP 1/10W 1K	
R7801	ERDS2TJ750T	CARBON 1/4W 75	

CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C6401	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C6402	ECEA0JKA470	ELECTROLYTIC 6.3V 47UF	
C6403	ECUV1H104ZFN	C CHIP 50V 0.1UF	

CRYSTAL OSCILLATOR

Ref. No.	Part No.	Part Name & Description	Remarks
X6401	EF0EC4004T4	CRYSTAL OSCILLATOR	

PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P6302	VJSS0886	CONNECTOR 20P	

SWITCHES

Ref. No.	Part No.	Part Name & Description	Remarks
SW6301	EVQ11G05R	SWITCH PUSH	
SW6302	EVQ11G05R	SWITCH PUSH	
SW6303	EVQ11G05R	SWITCH PUSH	
SW6304	EVQ11G05R	SWITCH PUSH	

JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK7801	VJHS0736	FRONT AUDIO/VIDEO JACK SOCKET	

MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
734	VMXS0575	LED SPACER	
735	VGMS0611	LED HOLDER	

11.3.3. CAPSTAN STATOR C.B.A. NR

INTEGRATED CIRCUITS

Ref. No.	Part No.	Part Name & Description	Remarks
IC2501	AN3846SC	IC, LINEAR	

RESISTORS

Ref. No.	Part No.	Part Name & Description	Remarks
R2501	ERJ14YJ1R0U	MGF CHIP 1/4W 1	
R2502	ERJ14YJ1R0U	MGF CHIP 1/4W 1	
R2505	ERJ6GEYJ242V	MGF CHIP 1/10W 2.4K	

CAPACITORS

Ref. No.	Part No.	Part Name & Description	Remarks
C2504	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2506	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2507	ECUV1H103ZFN	C CHIP 50V 0.01UF	
C2508	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2509	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2510	ECUV1E104KBN	C CHIP 25V 0.1UF	
C2511	ECUV1E104ZFN	C CHIP 25V 0.1UF	
C2517	VCUSQAE225ZF	C CHIP 25V 2.2UF	
C2519	ECUV1H102KBN	C CHIP 50V 1000PF	
C2520	VCUSQAE225ZF	C CHIP 25V 2.2UF	
C2521	VCUSQAE225ZF	C CHIP 25V 2.2UF	
C2522	VCUSQAE225ZF	C CHIP 25V 2.2UF	

MISCELLANEOUS

Ref. No.	Part No.	Part Name & Description	Remarks
491	XYN2+J7	SCREW W/WASHER,STEEL	
731(IC2505)	EZMPS300F12	MR HEAD	
732(P2502)	LSJS0097	CONNECTOR 12P	
733	LSMA0385	BACK PLATE,STEEL	

11.3.4. S-VHS JACK C.B.A.

DIODES

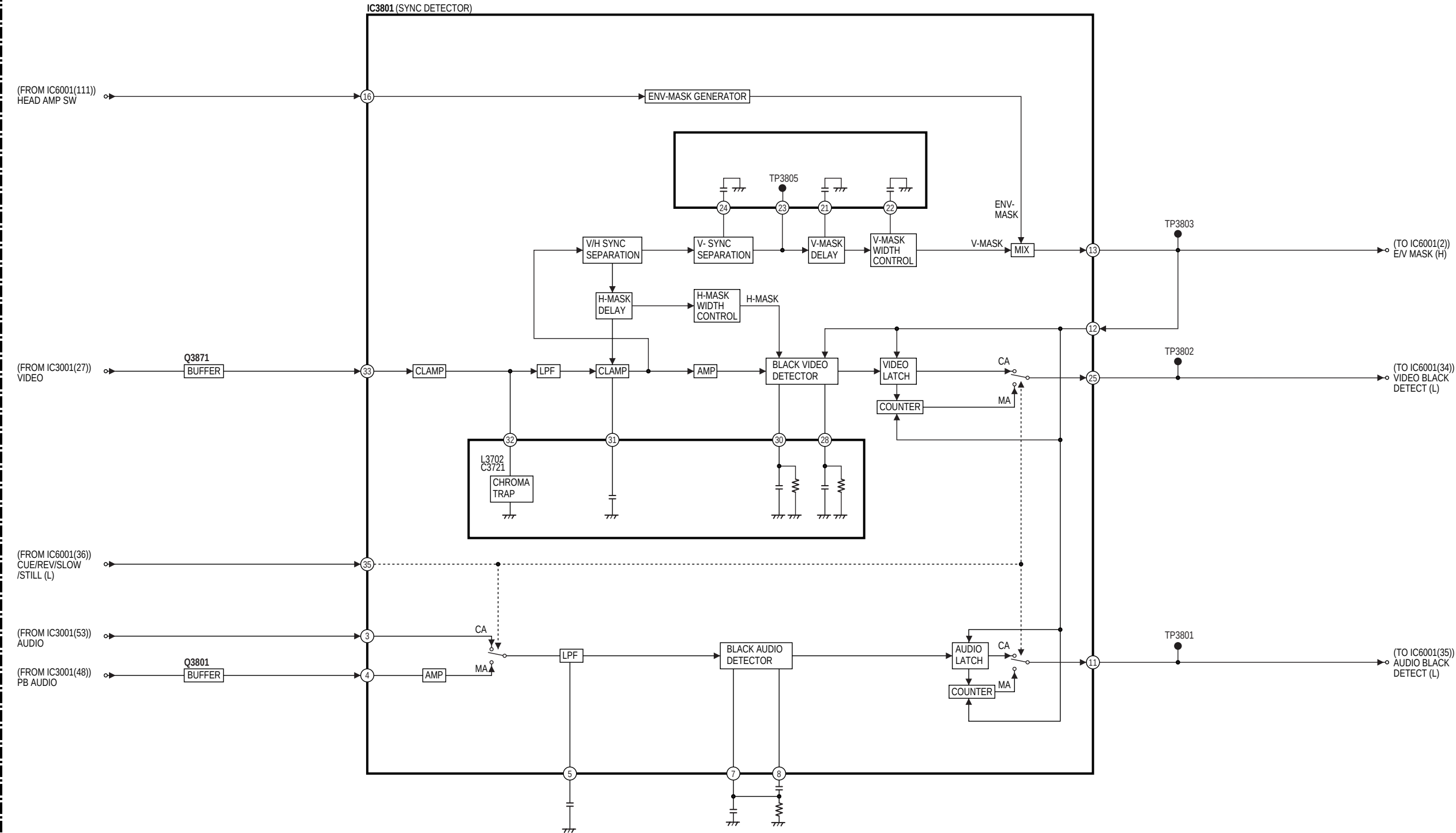
Ref. No.	Part No.	Part Name & Description	Remarks
D8301	MA4091-M	DIODE ZENER 9.1V	
D8301	MA4091-MKT	DIODE ZENER 9.1V	
D8301	MA4091-MMKT	DIODE ZENER 9.1V	
D8301	RD9.1ESAB1	DIODE ZENER 9.1V	
D8301	RD9.1ESAB2	DIODE ZENER 9.1V	
D8301	04AZ9.1ZTPA7	DIODE ZENER 9.1V	
D8302	MA4047-M	DIODE ZENER 4.7V	
D8302	MA4047-H	DIODE ZENER 4.7V	
D8302	RD4.7ESAB	DIODE ZENER 4.7V	
D8302	RD4.7ESAB2	DIODE ZENER 4.7V	
D8302	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8303	MA4047-M	DIODE ZENER 4.7V	
D8303	MA4047-H	DIODE ZENER 4.7V	
D8303	RD4.7ESAB	DIODE ZENER 4.7V	
D8303	RD4.7ESAB2	DIODE ZENER 4.7V	
D8303	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8304	MA4047-M	DIODE ZENER 4.7V	
D8304	MA4047-H	DIODE ZENER 4.7V	
D8304	RD4.7ESAB	DIODE ZENER 4.7V	
D8304	RD4.7ESAB2	DIODE ZENER 4.7V	
D8304	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8305	MA4047-M	DIODE ZENER 4.7V	
D8305	MA4047-H	DIODE ZENER 4.7V	
D8305	RD4.7ESAB	DIODE ZENER 4.7V	
D8305	RD4.7ESAB2	DIODE ZENER 4.7V	
D8305	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8306	MA4047-M	DIODE ZENER 4.7V	
D8306	MA4047-H	DIODE ZENER 4.7V	
D8306	RD4.7ESAB	DIODE ZENER 4.7V	
D8306	RD4.7ESAB2	DIODE ZENER 4.7V	
D8306	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8307	MA4047-M	DIODE ZENER 4.7V	
D8307	MA4047-H	DIODE ZENER 4.7V	
D8307	RD4.7ESAB	DIODE ZENER 4.7V	
D8307	RD4.7ESAB2	DIODE ZENER 4.7V	
D8307	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8308	MA4047-M	DIODE ZENER 4.7V	
D8308	MA4047-H	DIODE ZENER 4.7V	
D8308	RD4.7ESAB	DIODE ZENER 4.7V	
D8308	RD4.7ESAB2	DIODE ZENER 4.7V	
D8308	04AZ4.7ZTPA7	DIODE ZENER 4.7V	
D8309	MA4047-M	DIODE ZENER 4.7V	
D8309	MA4047-H	DIODE ZENER 4.7V	
D8309	RD4.7ESAB	DIODE ZENER 4.7V	
D8309	RD4.7ESAB2	DIODE ZENER 4.7V	
D8309	04AZ4.7ZTPA7	DIODE ZENER 4.7V	

PIN HEADERS

Ref. No.	Part No.	Part Name & Description	Remarks
P8301	LSJWMAN160AC	CONNECOTR CABLE W/OUT PLUG,DC5V	

JACKS

Ref. No.	Part No.	Part Name & Description	Remarks
JK8301	VJJW0034	S-JACK	
JK8302	VJJW0034	S-JACK	



MAIN C.B.A. VEPS6074SA (A) / VEPS6074SB (B)

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES
D'INCENDIE N'UTILISER QUE DES FUSIBLES DE MÊME
TYPE 1.6A 125/250V

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN  HAVE
SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,
USE ONLY THE SPECIFIED PARTS.

NOTE:
CIRCUIT BOARD LAYOUT SHOWS COMPONENTS INSTALLED FOR VARIOUS MODELS.
FOR PROPER PARTS CONTENT FOR THE MODEL YOU ARE SERVICING,
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST.

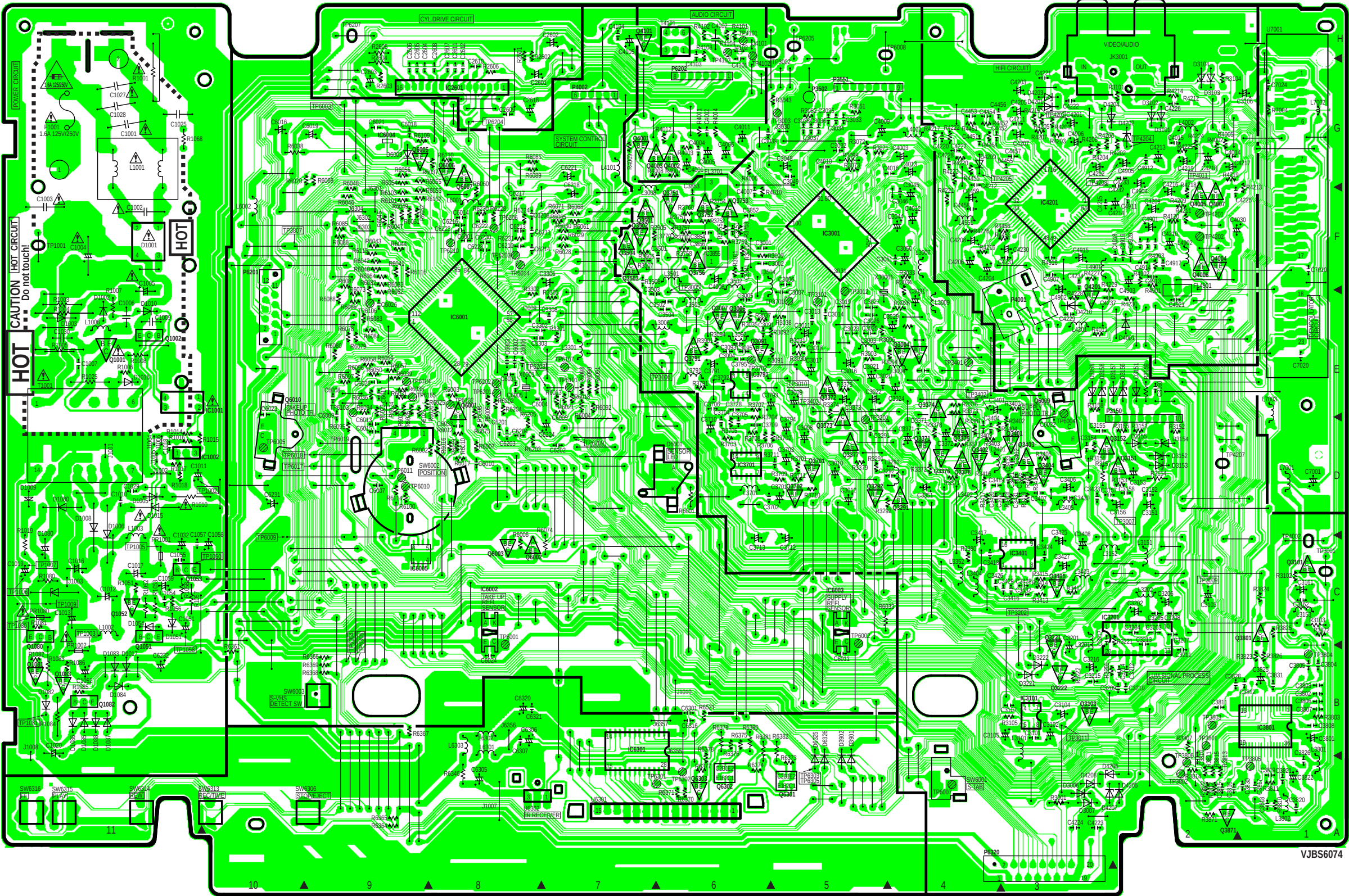
NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

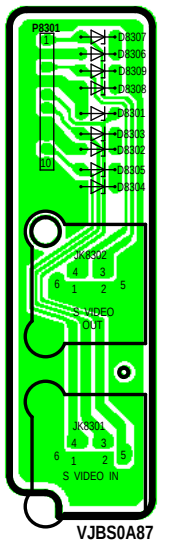
COMPARISON CHART
OF MODELS & MARKS

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B

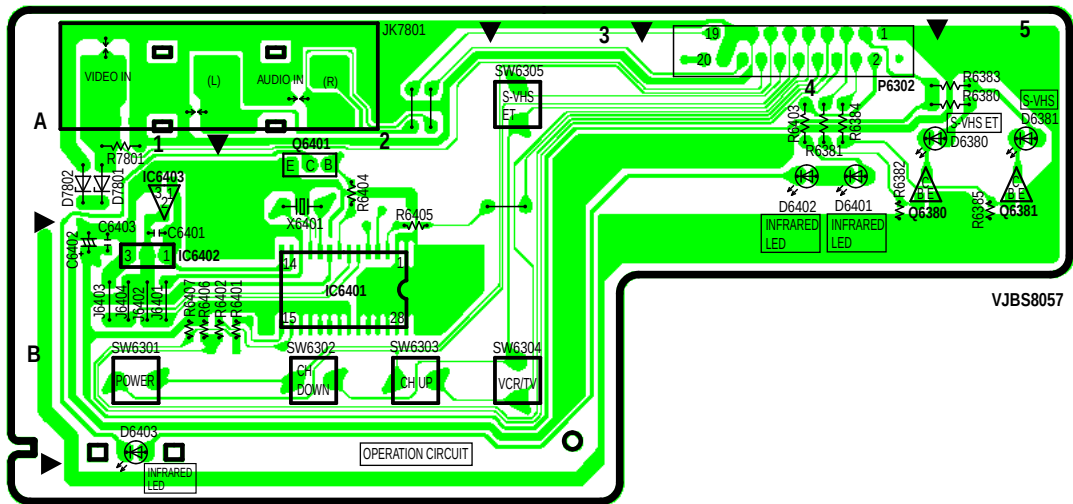
HOT CIRCUIT.BE CAREFUL AND USE AN ISOLATION TRANSFORMER WHEN SERVICING.



S-VHS JACK
C.B.A.
VEPS0A87A



OPERATION C.B.A. VEPS8057D

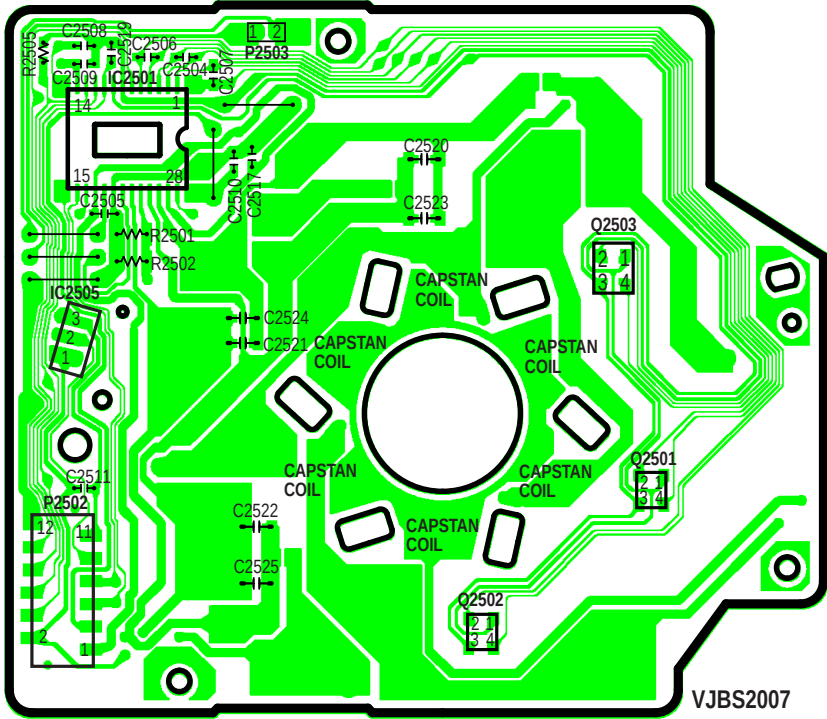


NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
CIRCUIT BOARD LAYOUT SHOWS COMPONENTS INSTALLED FOR VARIOUS MODELS.
FOR PROPER PARTS CONTENT FOR THE MODEL YOU ARE SERVICING,
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST.

NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.

CAPSTAN STATOR C.B.A. VEMS0344



NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

NOTE:
CIRCUIT BOARD LAYOUT INCLUDES COMPONENTS WHICH ARE NOT USED.
PLEASE REFER TO THE SCHEMATIC DIAGRAM AND PARTS LIST FOR PROPER PARTS CONTENT.

NOTE:
WHEN INSTALLING THE IC2501(AN3846SC) OR CAPSTAN STATOR C.B.A.,
BE SURE TO APPLY SILICON GREASE(VFK1301). REFER TO "CAPSTAN STATOR C.B.A."
OF MACHANISM SECTION IN DISASSEMBLY/ASSEMBLY PROCEDURES.

NOTE:
THE FOLLOWING PARTS ON THE CAPSTAN STATOR C.B.A. ARE NOT SUPPLIED SEPARATELY.
PLEASE ORDER AND REPLACE WITH THE CIRCUIT BOARD ASSEMBLY INSTEAD OF INDIVIDUAL PARTS.
(Q2501, Q2502, Q2503, CAPSTAN COIL)

- Important safety notice**
Components identified by the sign  have special characteristics important for safety. When replacing any of these components. Use only the specified parts.
- Do not use the part number shown on this drawing for ordering.
The correct part number and part value is shown in the parts list, and may be slightly different or amended since this drawing was prepared.
- Use only original replacement parts:
To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.
- Parts different in shape or size may be used.
However, only interchangeable parts will be supplied as service replacement parts.
- Test point information
 ① :Test point with a jumper wire across a hole in P.C.B.
 :Test point with a component lead on the foil side.
 :Test point with no test pin.
 :Test point with a test pin.

Schematic Diagram Notes

- Indication for Zener Voltage of Zener Diodes
The Zener Voltage of Zener Diodes are indicated as such on Schematic Diagrams.

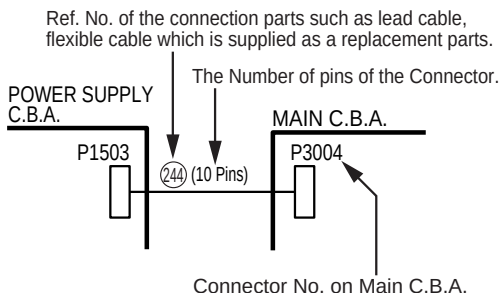
Example:

(6.2V).....Zener Voltage

- How to identify Connectors
Each connector is labeled with a Connector No. and Pin No. Indicating what it is connected to, in other words, its counter part.
Use the interconnection schematic diagram to find the connection between associated connectors.

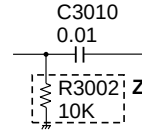
Example:

The connections between C.B.A.s are shown below.



- Parts enclosed in dashed lines marked "Z" are not used in any models included in this service manual.

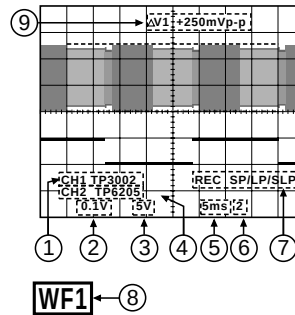
Example:



- The part number shown on this drawing is only main part number, except for safety parts. Be sure to make your orders of replacement parts according to the parts list.

Signal Waveform Note

How to read Signal Waveform



- Connecting Point
- Volts/Div
- Volts/Div
- Connecting Point
- Time/Div
- Trigger Channel of the scope
(1:CH1,2:CH2)
- Operation Mode of VCR
- Waveform Point on Schematic
- $\Delta V1$:Peak to Peak

Voltage Chart Note

Voltage Measurement

- Color bar signal in SP mode.
- :Unmeasurable or not necessary to measure.

Circuit Board Layout Note

Circuit Board Layout shows components installed for various models.

For proper parts content for the model you are servicing, please refer to the schematic diagram and parts list.

NOTE:

Circuit Board Layout includes components which are not used.

COMPARISON CHART
OF MODELS & MARKS

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B
Not Used	Z

Note : Refer to item 3 of Schematic Diagram Notes for mark "Z".

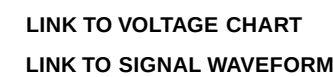
NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

KEY MATRIX CHART

OUT IN	SCAN 1 PIN 104	SCAN 2 PIN 105
DATA 8 PIN 102	—	REC /TIME
DATA 9 PIN 8	—	REW
DATA 10 PIN 9	—	FF
DATA 11 PIN 10	CH DOWN	POWER
DATA 12 PIN 11	VCR/TV	CH UP
DATA 13 PIN 12	STOP /EJECT	PLAY

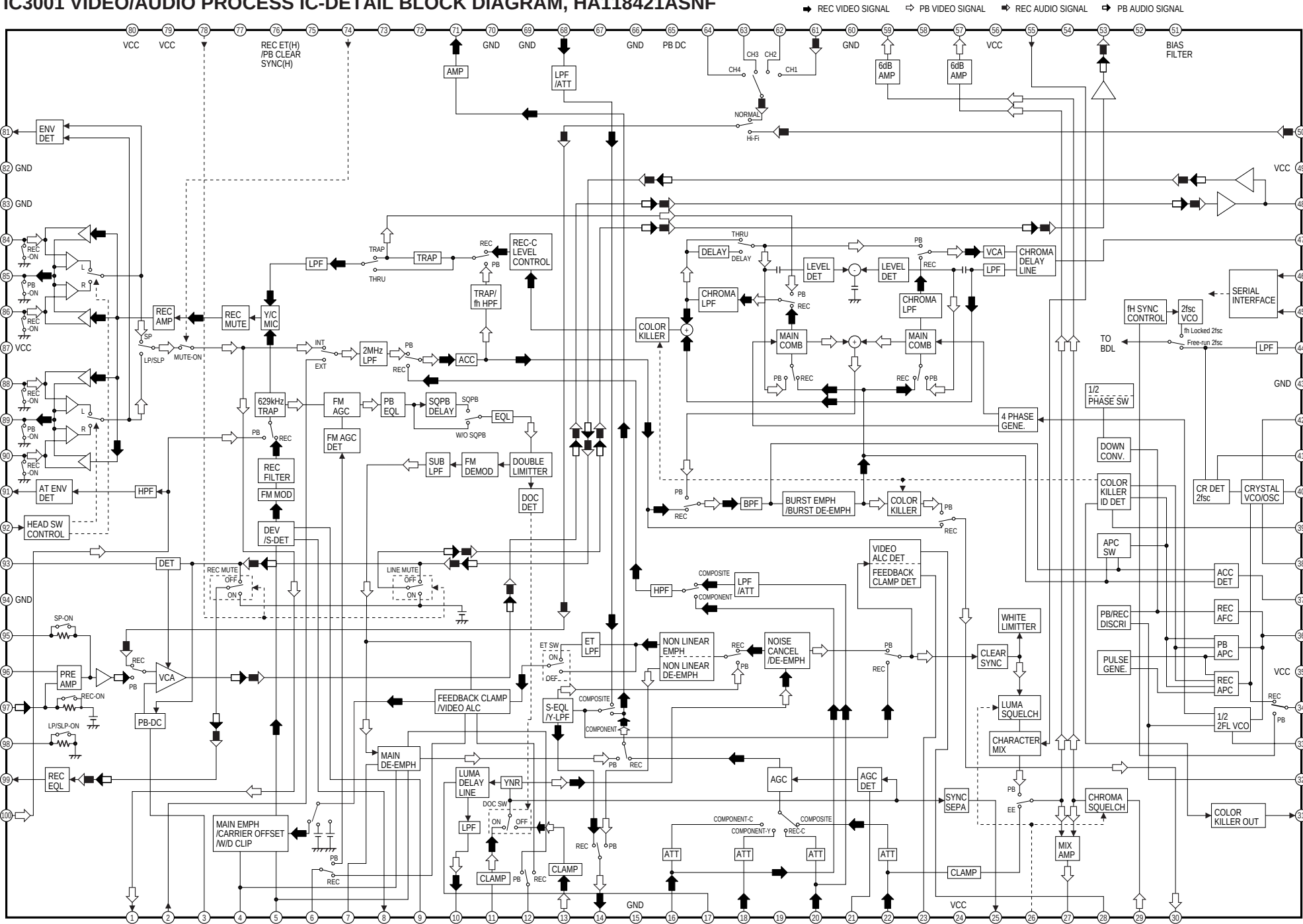


NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



IC3001 VIDEO/AUDIO SIGNAL PROCESS IC- DETAIL BLOCK DIAGRAM, HA118421ASNF

IC3001 VIDEO/AUDIO PROCESS IC-DETAIL BLOCK DIAGRAM, HA118421ASNF

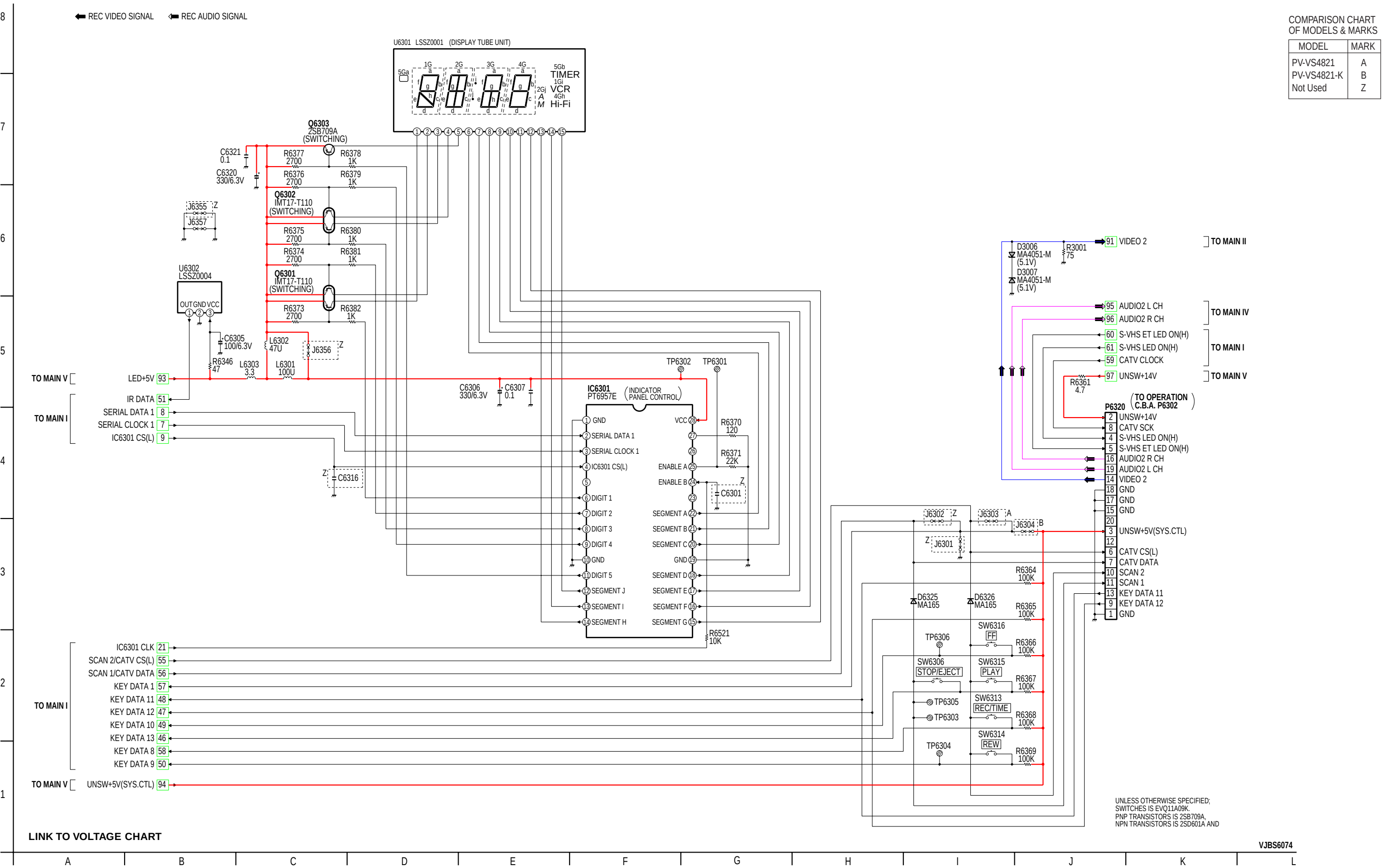


MAIN III (OPERATION) SCHEMATIC DIAGRAM

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

COMPARISON CHART
OF MODELS & MARKS

MODEL	MARK
PV-VS4821	A
PV-VS4821-K	B
Not Used	Z



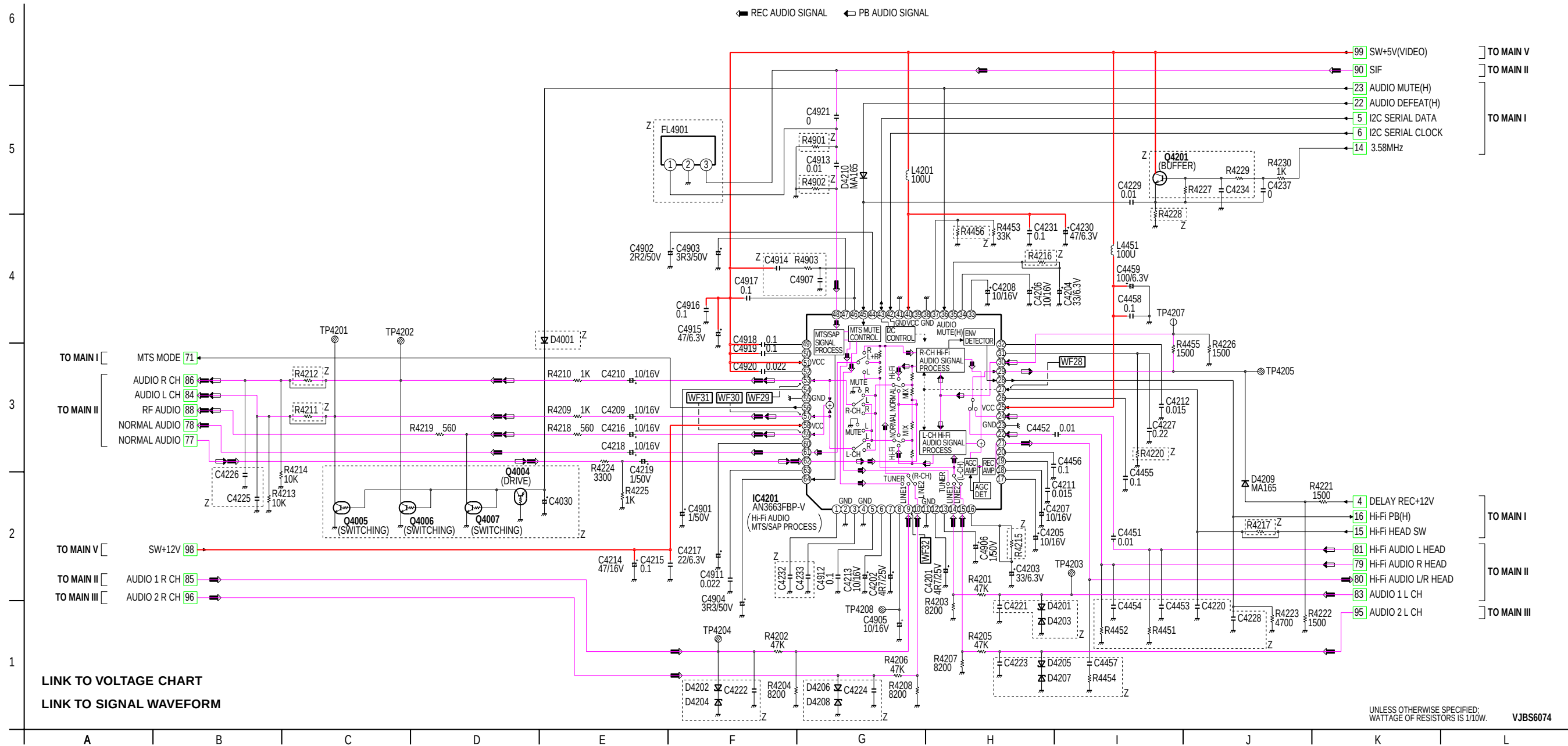
LINK TO VOLTAGE CHART

VJBS6074

MAIN IV (Hi-Fi) SCHEMATIC DIAGRAM

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



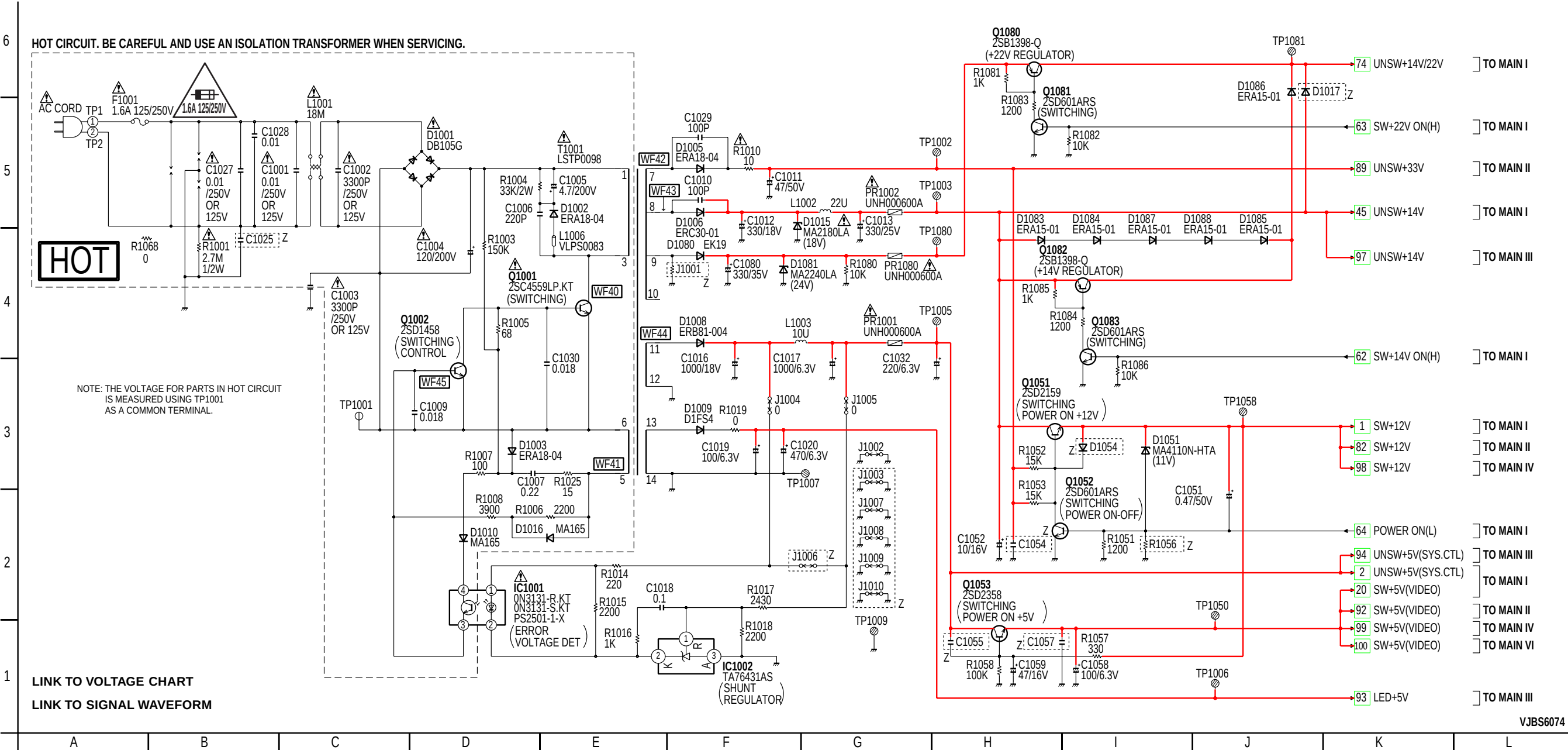
MAIN V (POWER SUPPLY) SCHEMATIC DIAGRAM

NOTE: PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

NOTE: FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES, REFER TO BEGINNING OF SCHEMATIC SECTION.

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE 1.6A 125/250V FUSE.
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'T INCENDIE N' UTILISERQUE DES FUSIBLE DE MÊME TYPE 1.6A 125/250V

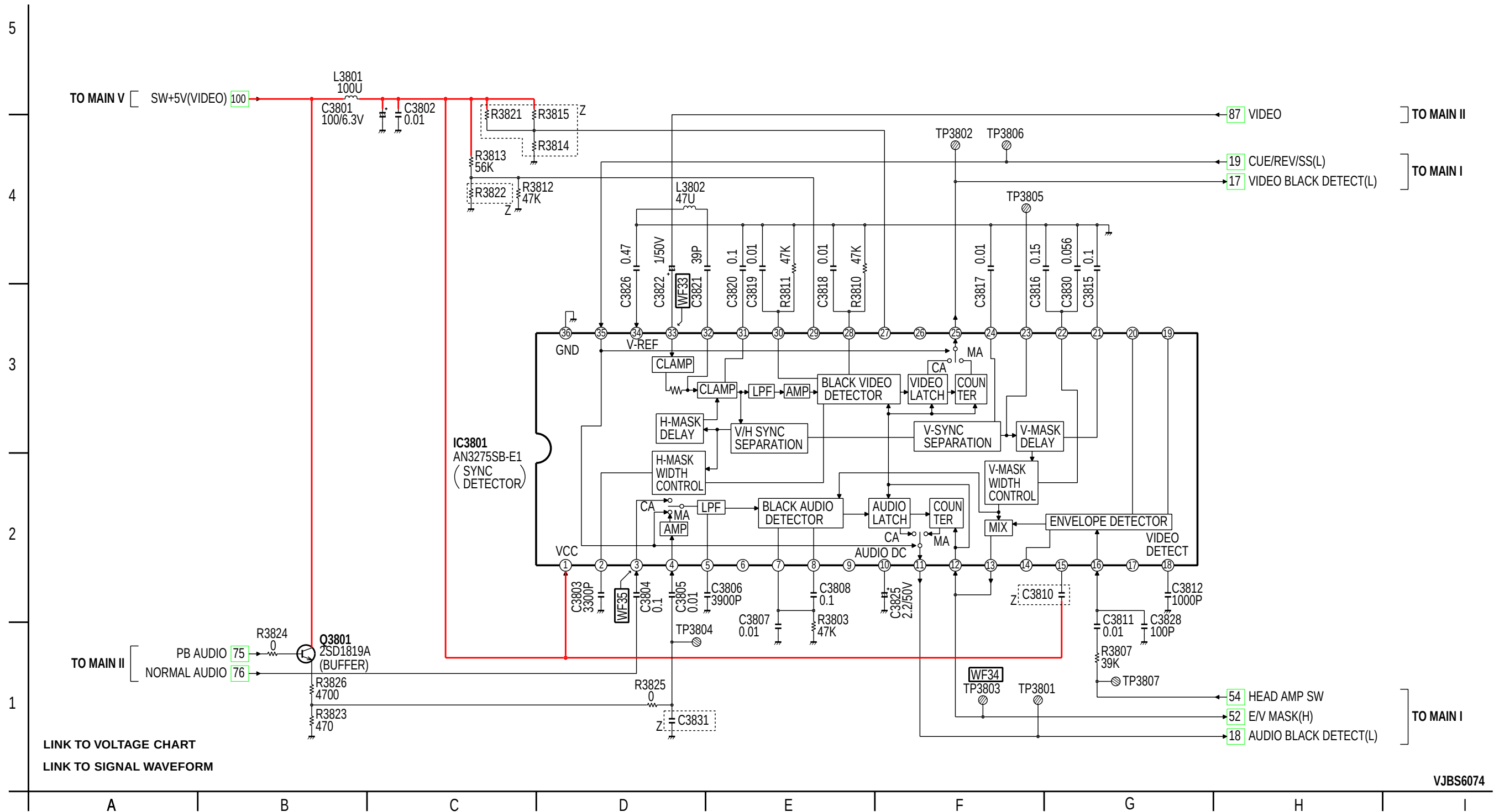
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN  HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.



MAIN VI (ADVANCE) SCHEMATIC DIAGRAM

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

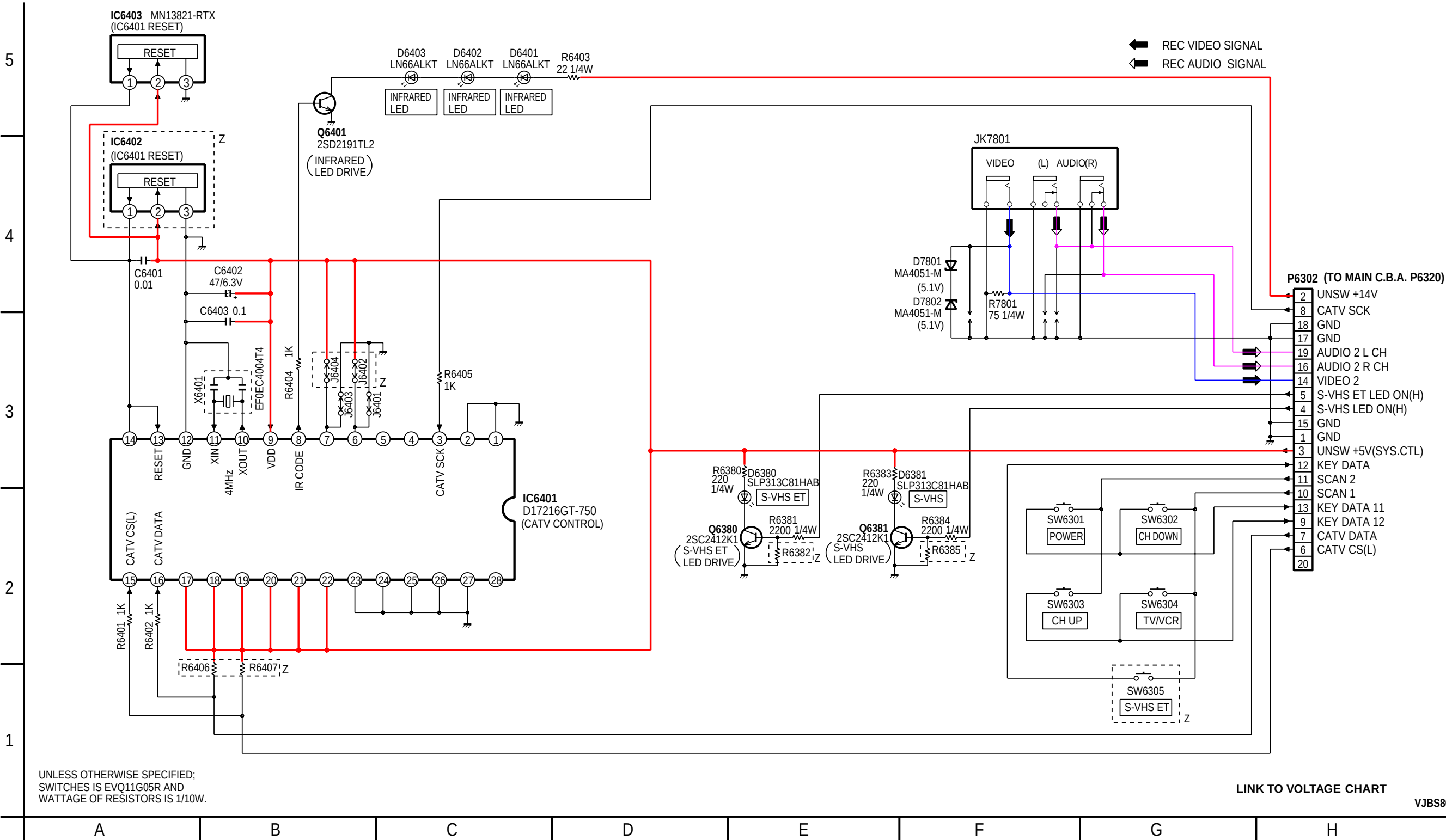
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



OPERATION SCHEMATIC DIAGRAM

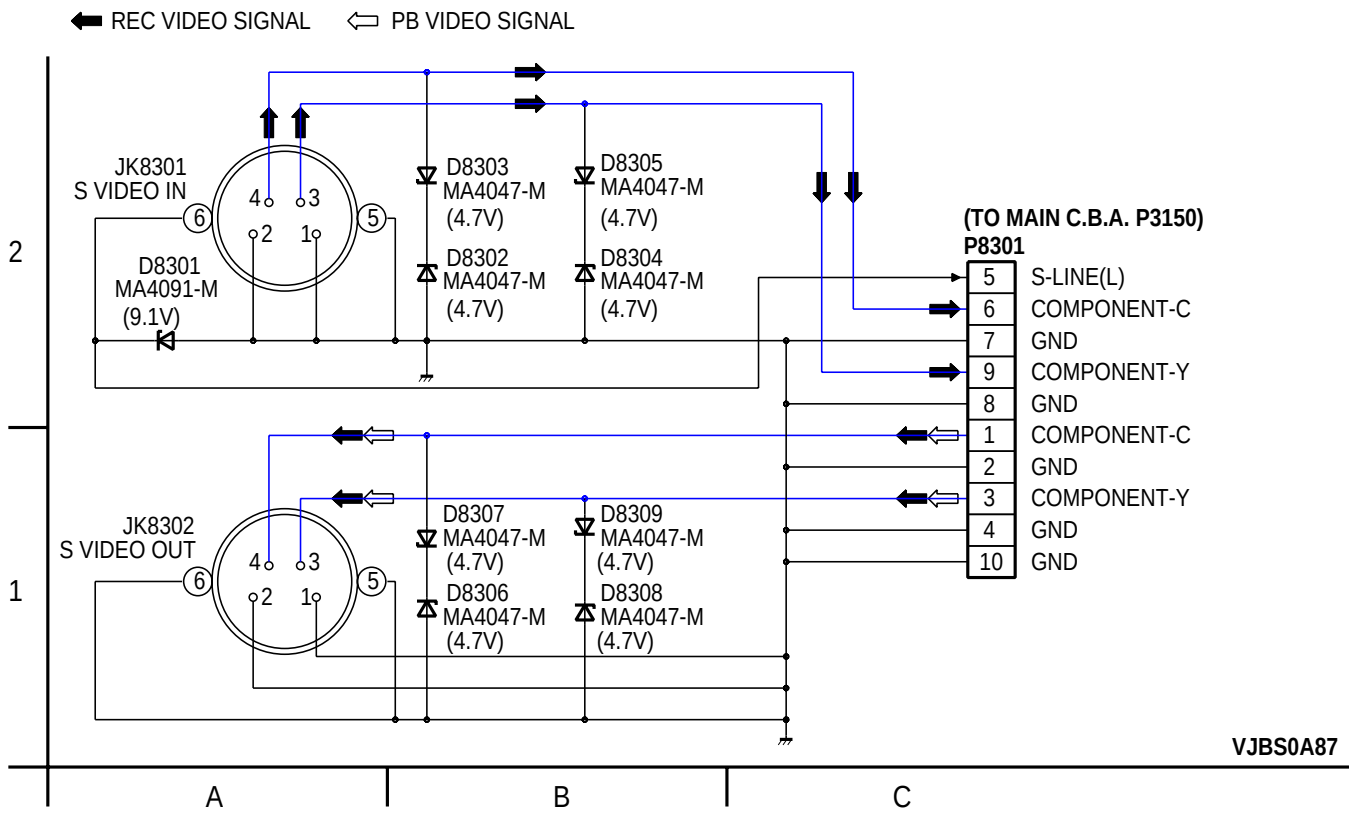
NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



S-VHS JACK SCHEMATIC DIAGRAM

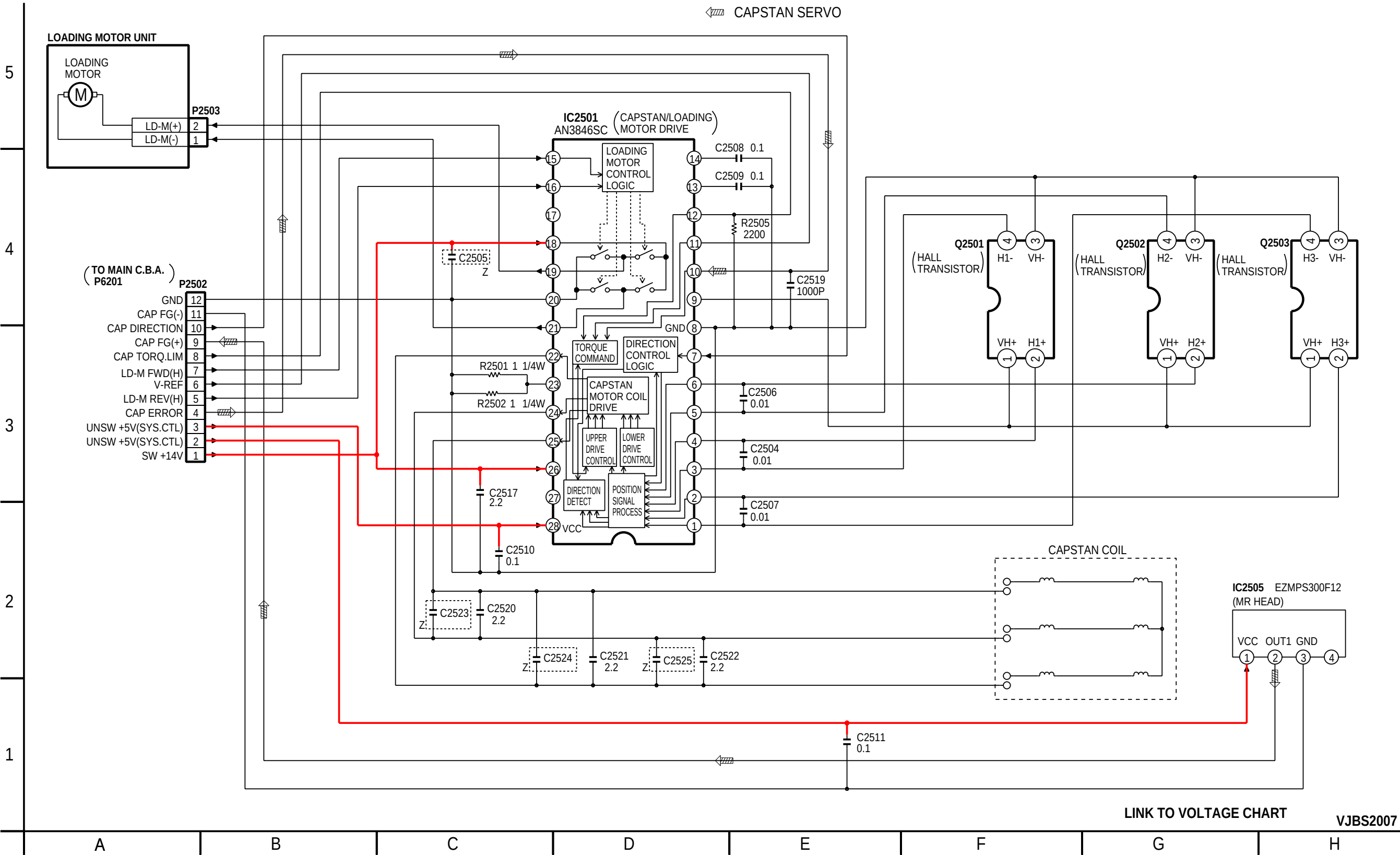
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



CAPSTAN STATOR SCHEMATIC DIAGRAM

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

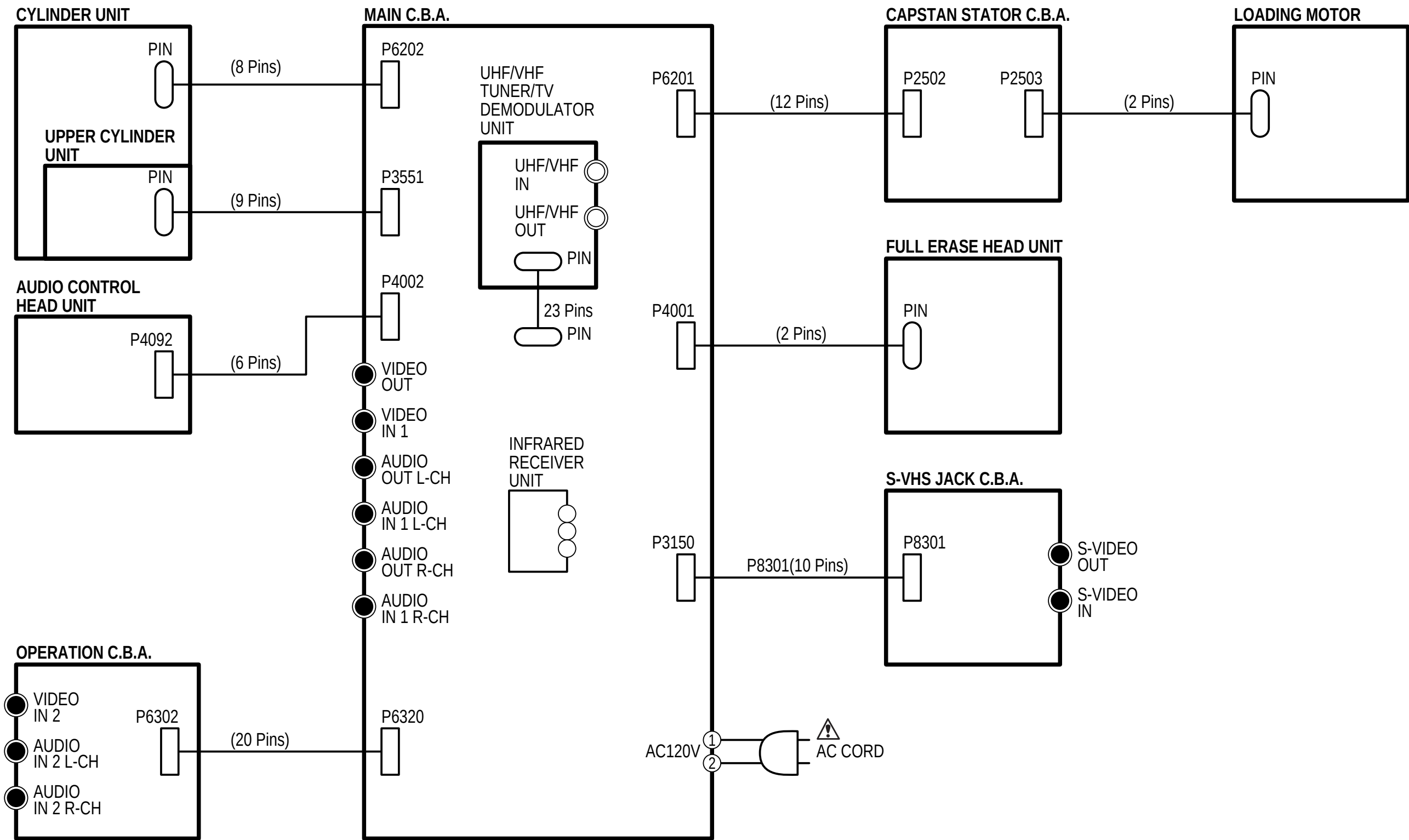
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



INTERCONNECTION SCHEMATIC DIAGRAM

NOTE:
PARTS ENCLOSED IN DASHED LINES MARKED "Z" ARE NOT USED.

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

MAIN C.B.A. (POWER SUPPLY/VIDEO/AUDIO SECTION)

MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP	MODE PIN NO.	STOP
IC1001		46	4.9	IC3101		8	0.1	2	0	57	5.9	C	3.5	Q3375		B	3.1	TP1007	0
1	5.2	47	3.0	1	0	9	0.1	3	2.4	58	12.1	B	0	E	2.7	Q3702		TP1009	0
2	4.2	48	2.7	2	0	10	0	4	0	59	5.9	Q3091		C	5.1	E	0	TP1050	5.2
3	1.4	49	5.0	3	0	11	0.1	5	2.4	60	0.1	E	2.9	B	2.3	C	0	TP1058	12.1
4	1.4	50	---	4	0	12	0	6	2.5	61	2.5	C	4.9	Q3376		B	1.8	TP1080	24.5
IC1002		51	2.9	5	0	13	0	7	0	62	2.5	B	2.2	E	2.7	Q3751		TP1081	14.9
1	2.5	52	---	6	5.1	14	0	8	0.4	63	0.1	Q3101		C	5.1	E	4.9	TP3001	2.8
2	0	53	2.6	7	1.7	IC3791		9	0	64	0.6	E	2.8	B	2.0	C	4.9	TP3002	0.9
3	4.2	54	---	8	0	1	5.0	10	0			C	0	Q3377		B	4.9	TP3003	0
IC3001		55	0	IC3201		2	0.1	11	0	Q1001		B	2.1	E	2.1	Q3752		TP3005	0.2
1	0.9	56	5.1	1	0	3	---	12	0	E	0	Q3103		C	5.1	E	2.9	TP3006	3.0
2	2.9	57	0.1	2	0	4	0	13	0	C	135.6	E	1.9	B	2.7	C	4.9	TP3007	1.5
3	2.6	58	-	3	5.1	5	---	14	0	B	0.3	C	0	Q3378		B	3.6	TP3009	0
4	2.0	59	2.2	4	0	6	0	15	0.1	Q1002		B	2.5	E	2.8	Q3753		TP3010	4.9
5	2.0	60	0	5	2.4	7	0	16	0.1	E	0	Q3151		C	0	E	2.9	TP3011	0
6	2.5	61	0.1	6	2.1	8	0	17	0.8	C	0.3	E	2.7	B	2.2	C	4.9	TP3012	0.1
7	3.0	62	0.1	7	0	IC3801		18	2.5	B	0.6	C	0	Q3401		B	1.8	TP3101	0
8	0.2	63	---	8	5.1	1	5.1	19	2.5	Q1051		B	2.0	E	3.5	Q3756		TP3201	2.2
9	2.7	64	---	9	2.5	2	1.1	20	2.0	E	12.1	Q3152		C	5.0	E	0.2	TP3202	1.9
10	2.5	65	0.1	10	2.5	3	0	21	2.1	C	15.5	E	3.5	B	2.9	C	4.8	TP3401	2.4
11	3.2	66	0.1	11	2.0	4	0.1	22	2.1	B	12.7	C	0	Q3402		B	0.9	TP3402	2.8
12	2.9	67	---	12	10.4	5	2.4	23	0	Q1052		B	2.8	E	3.8	Q3791		TP3403	2.8
13	3.2	68	0.1	13	0	6	---	24	2.1	E	0.6	Q3221		C	5.0	E	0	TP3701	2.5
14	2.5	69	0	14	3.8	7	0	25	5.1	C	12.7	E	4.7	B	3.2	C	4.9	TP3702	3.2
15	0	70	0.1	15	0	8	0	26	2.1	B	0	C	0	Q3403		B	3.0	TP3801	0
16	2.9	71	2.4	16	0	9	---	27	0	Q1053		B	0	E	1.8	Q3801		TP3802	5.0
17	1.6	72	0	17	0	10	3.1	28	0.8	E	5.2	Q3222		C	11.5	E	2.1	TP3803	1.7
18	2.9	73	1.2	18	0	11	0.1	29	1.5	C	5.3	E	0	B	2.4	C	0	TP3804	0
19	3.5	74	0	19	0	12	0.1	30	0.8	B	5.9	C	5.0	Q3404		B	0	TP3805	0.1
20	2.8	75	0.1	20	5.1	13	1.7	31	0	Q1080		B	5.0	E	11.5	Q3871		TP3806	5.0
21	2.2	76	0	IC3401		14	0	32	0	E	24.6	Q3291		C	2.8	E	2.1	TP3807	5.1
22	2.9	77	---	1	0	15	0	33	0	C	14.9	E	0	B	12.1	C	0	TP4002	0
23	0.1	78	0	2	0	16	0.1	34	0.1	B	24.6	C	5.3	Q3405		B	2.7	TP4011	0
24	4.9	79	5.1	3	0	17	---	35	2.6	Q1081		B	0.1	E	2.9	Q4001		TP4101	0
25	0.5	80	5.1	4	2.4	18	0	36	0	E	0	Q3292		C	5.0	E	4.4	TP4102	0
26	0	81	0	5	0	19	2.3	37	1.7	C	24.6	E	5.2	B	2.3	C	5.1	TP4103	0
27	1.8	82	0	6	0	20	0	38	0	B	0	C	0.1	Q3501		B	5.1	TP4201	0
28	3.0	83	0	7	0.1	21	0	39	---	Q1082		B	0	E	0	Q4002		TP4202	0
29	1.9	84	2.5	8	5.1	22	2.0	40	5.0	E	15.5	Q3371		C	5.4	E	0	TP4203	0
30	2.2	85	2.5	9	0	23	0.1	41	0	C	15.5	E	1.1	B	0	C	-0.1	TP4204	0
31	0.1	86	2.5	10	0	24	1.8	42	4.8	B	14.8	C	0	Q3502		B	0.8	TP4205	1.5
32	0	87	5.1	11	0	25	5.0	43	4.9	Q1083		B	1.7	E	0	Q4003		TP4207	0.8
33	4.9	88	0.1	12	0	26	---	44	2.4	E	0.7	Q3372		C	0	E	0	TP4208	0.4
34	0.1	89	0.1	13	0	27	2.4	45	4.6	C	0.1	E	2.4	B	0	C	0		
35	4.9	90	0	14	0	28	3.0	46	3.6	B	0	C	0	Q3503		B	0.8		
36	0	91	0	15	0	29	2.5	47	0.1	Q3004		B	1.8	E	0	Q4101			
37	0	92	2.9	16	5.1	30	3.1	48	2.3	E	1.8	Q3373		C	0.1	E	0		
38	---	93	0	IC3701		31	3.4	49	2.2	C	5.1	E	2.7	B	0	C	0		
39	0	94	0	1	5.2	32	2.5	50	0	B	1.5	C	5.1	Q3504		B	0		
40	0	95	2.7	2	0.1	33	0	51	5.1	Q3006		B	2.3	E	0				
41	2.8	96	2.6	3	5.0	34	0	52	3.5	E	0	Q3374		C	0.1	TP1001	0		
42	2.2	97	2.6	4	3.5	35	5.0	53	0.1	C	3.5	E	3.2	B	0	TP1002	34.2		
43	0	98	0.1	5	0	36	0	54	2.5	B	0	C	0	Q3701		TP1003	15.5		
44	2.3	99	2.5	6	0	IC4201		55	0	Q3007		B	2.6	E	2.5	TP1005	5.3		
45	0	100	2.9	7	0	1	0	56	0	E	0.1			C	0	TP1006	5.7		

NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

MAIN C.B.A. (SYSTEM CONTROL/SERVO SECTION)

MODE PIN NO.	REC	PLAY
IC2601		
1	14.4	14.4
2	14.4	14.4
3	14.9	14.9
4	1.2	1.2
5	5.2	5.2
6	0.9	0.9
7	1.0	1.0
8	0.6	0.6
9	3.0	2.8
10	1.5	1.5
11	0	0
12	3.9	3.9
13	3.9	3.9
14	3.9	3.9
15	0.1	0.1
16	14.4	14.5
IC6001		
1	5.2	5.2
2	1.7	1.7
3	---	---
4	---	0
5	5.3	5.2
6	0	0
7	0	0
8	5.0	5.0
9	5.0	0
10	5.0	5.0
11	5.0	5.0
12	5.0	5.0
13	5.1	5.1
14	0	0
15	5.0	5.0
16	4.9	4.9
17	5.1	5.1
18	0.1	0.1
19	5.1	5.1
20	4.9	---
21	4.8	4.8
22	0	0
23	5.1	0
24	0	0
25	2.4	2.4
26	0	0
27	0	0
28	---	---
29	0	2.6
30	0.1	0
31	0.1	0
32	0	3.1
33	0	0
34	5.0	5.0
35	0	0
36	5.1	0
37	2.4	0

MODE PIN NO.	REC	PLAY
38	2.5	2.5
39	2.6	2.6
40	5.1	5.1
41	0.1	0
42	0	---
43	0.1	0.1
44	0	5.1
45	0	0
46	0	0.1
47	0	0
48	0	0
49	5.1	5.1
50	0	5.1
51	0	0
52	2.1	0
53	0.1	0
54	0.1	2.2
55	0.1	0.1
56	2.0	0
57	2.8	0
58	0	0
59	2.6	0.1
60	2.6	0
61	0	0
62	0.1	0
63	0	0
64	0.1	0.1
65	0	0
66	0	0
67	0	0.1
68	0	0
69	0	0
70	0	0
71	0	0
72	0	0.2
73	0	0
74	0	1.2
75	---	---
76	2.6	0.1
77	0	0
78	0.1	2.6
79	0.1	0.1
80	0	0
81	2.0	0
82	0	5.1
83	0	0
84	0	0
85	2.6	0
86	5.1	0
87	4.9	0
88	5.0	0
89	4.3	0
90	0	0
91	0	2.1
92	0	0.1

MODE PIN NO.	REC	PLAY
93	0	0
94	0	0
95	0	0
96	0	4.9
97	0	0
98	0	0
99	5.1	5.1
100	0	0
101	0	0.1
102	0	0
103	0	5.2
104	5.1	0
105	0.1	0
106	0	0
107	0	5.2
108	0	0.1
109	0	0
110	0	2.6
111	0	0
112	0	0
IC6002		
1	1.2	1.2
2	0	0
3	0	0
4	1.4	---
IC6003		
1	2.4	2.4
2	1.2	1.2
3	0	0
4	5.1	0.2
IC6004		
1	5.2	5.2
2	5.2	5.2
3	0	0
IC6005		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.9	0
6	4.8	4.8
7	0	0
8	5.3	5.3
IC6301		
1	0	0
2	0	0
3	5.1	0
4	4.9	0
5	---	---
6	0	0
7	0	0
8	4.6	0
9	0	0
10	0	0
11	4.7	0

MODE PIN NO.	REC	PLAY
12	0	0
13	0	0
14	2.9	0
15	0	0
16	0	2.5
17	0	0
18	0	3.1
19	0	0
20	0.1	3.1
21	3.6	0
22	0	3.1
23	---	---
24	0	2.6
25	0.1	0.1
26	---	---
27	1.4	1.4
28	0	0
Q6001		
E	0	0
C	---	---
B	0	0
Q6002		
E	12.1	12.1
C	11.9	0
B	11.3	12.1
Q6003		
E	5.1	0.2
C	11.3	12.1
B	4.5	0
Q6005		
E	4.4	4.4
C	5.1	5.2
B	5.3	5.3
Q6006		
E	0.7	0.7
C	0	0.1
B	0	0
Q6007		
E	5.1	5.2
C	5.1	5.1
B	0.1	0.1
Q6009		
E	0	0
C	5.0	5.0
Q6010		
E	0	0
C	4.9	0.1
Q6301		
E1	5.1	5.0
C1	-0.8	-1.2
B1	0	5.0
E2	5.1	5.0
C2	0.1	-1.1
B2	5.0	5.0

MODE PIN NO.	REC	PLAY
Q6302		
E1	5.1	5.0
C1	-0.9	-1.0
B1	5.0	5.0
E2	5.1	5.0
C2	-0.7	-1.2
B2	5.0	4.9
Q6303		
E	5.0	5.0
C	-1.5	-1.2
B	0	5.0
TP6001	5.1	5.2
TP6002	5.2	0.1
TP6003	0	0
TP6004	5.0	5.0
TP6005	4.9	0.1
TP6007	0	0
TP6008	0	0
TP6009	5.3	5.3
TP6010	4.9	4.9
TP6011	4.8	4.8
TP6014	0	0
TP6017	0	0
TP6018	5.2	0
TP6019	0	0
TP6101	0.1	0
TP6102	-	-
TP6103	1.7	0.1
TP6104	0.1	0
TP6105	5.1	0
TP6106	0.1	0
TP6107	5.1	0.1
TP6201	2.4	2.4
TP6202	0.1	2.5
TP6203	2.6	2.6
TP6204	1.2	0.7
TP6205	0	0
TP6206	3.0	2.0
TP6207	0	2.6
TP6208	0	0.1
TP6209	2.4	2.4
TP6210	5.1	5.1
TP6301	0	0.1
TP6302	5.1	5.1
TP6303	3.9	0
TP6304	0.1	5.0
TP6305	0	0
TP6306	0.1	5.0

CAPSTAN STATOR C.B.A.

[illegible]

NOTE:

FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

OPERATION
C.B.A.

[illegible]



Omnivision **VHS**

Panasonic®

Video Cassette Recorder Operating Instructions

Model No. **PV-VS4821**



Connections and Initial Setup Procedures are on pages 8 to 15.



VCR Plus+, C³, ALLSET and PlusCode are registered trademarks of Gemstar Development Corporation. The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.



As an ENERGY STAR® Partner, Matsushita Electric Corporation of America has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.

Please read these instructions carefully before attempting to connect, operate or adjust this product. Please save this manual.

Spanish Quick Use Guide is included. (Guía para rápida consulta en español está incluida.)

LSQT0370A

Initial Setup
(Connection)

Basic
Operation

Timer
Recording

Advanced
Operation

For Your
Information

Important Safeguards and Precautions

FOR YOUR SAFETY, READ AND RETAIN ALL SAFETY AND OPERATING INSTRUCTIONS. HEED ALL WARNINGS IN THE MANUAL AND ON THE UNIT

INSTALLATION

1 POWER SOURCE CAUTION

Operate only from a power source indicated on the unit or in this manual. If necessary, have your Electric Utility Service Company or Video Products Dealer verify the power source in your home.

2 POLARIZED OR GROUNDING PLUG

As a safety feature, this Video product comes with either a polarized power cord plug (one blade is wider than the other), or a three-wire grounding type plug.

POLARIZED PLUG CAUTION:

This plug will only fit into an outlet one way. If you cannot fully insert the plug, try reversing it. If it still will not fit, have an electrician install the proper wall outlet. Do not defeat the safety feature by tampering with the plug.

GROUNDING PLUG CAUTION:

This plug will only fit into a three-hole grounding outlet. If necessary, have an electrician install the proper outlet. Do not defeat the safety feature by tampering with the plug.

3 POWERCORD

Make sure power cords are routed so that they are not likely to have anything resting on them, roll over them, or be in the way of walking traffic. If an extension cord is used, make sure it also has either a polarized or grounded plug and that the cords can be securely connected. Frayed cords, damaged plugs, and damaged or cracked wire insulation are hazardous and should be replaced by a qualified service technician. Overloaded outlets and extension cords are fire hazards and should be avoided.

4 DO NOT BLOCK VENTILATION HOLES

Ventilation openings in the cabinet release heat generated during operation. If they are blocked, heat build-up inside the unit can cause failures that may result in a fire hazard or heat damage to cassettes. For protection, follow these rules:

- Never cover ventilation slots or the unit while in use, or operate the unit when placed on a bed, sofa, rug, or other soft surface.
- Avoid built-in installation, such as a book case or rack, unless proper ventilation is provided.

5 AVOID EXTREMELY HOT LOCATIONS OR SUDDEN TEMPERATURE CHANGES

Do not place the unit over or near any kind of heater or radiator, in direct sunlight, inside a closed vehicle, etc.. Do not move the unit suddenly between areas of extreme temperature variation. If the unit is suddenly moved from a cold place to a warm place, moisture may condense in the unit and on the tape.

6 TO AVOID PERSONAL INJURY

- Do not place unsecured equipment on a sloping surface.
- Do not place this unit on any support that is not firm, level, and adequately strong. The unit could fall causing serious injury to a child or adult and damage to the unit.
- An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
- Carefully follow all operating instructions and use the manufacturer's recommended accessories when operating this unit or connecting it to any other equipment.

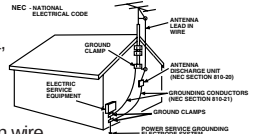


OUTDOOR ANTENNA INSTALLATION

1 SAFE ANTENNA AND CABLE CONNECTION

If an outside antenna or cable system is connected to the equipment, be sure the antenna or cable system is grounded so as to provide some protection against built up static charges and voltage surges. Section

810 of the National Electrical Code, ANSI/NFPA 70 (in Canada, part 1 of the Canadian Electrical Code) provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements for the grounding electrode.



2 KEEP ANTENNA CLEAR OF HIGH VOLTAGE POWER LINES OR CIRCUITS

An outside antenna system should be located well away from power lines, electric light or power circuits and where it will never come into contact with these power sources if it should happen to fall. When installing an outside antenna, extreme care should be taken to avoid touching power lines, circuits or other power sources as this could be fatal. Because of the hazards involved, antenna installation should be left to a professional.

USING THE VIDEO UNIT

If the unit has been in storage or moved to a new location, refer first to the INSTALLATION section of these safeguards.

1 KEEP THIS VIDEO UNIT AWAY FROM WATER OR MOISTURE OF ANY KIND.

2 **IF EQUIPMENT IS EXPOSED TO RAIN, MOISTURE, OR STRONG IMPACT,** unplug the unit and have it inspected by a qualified service technician before use.

3 DURING AN ELECTRICAL STORM

During a lightning storm, whether indoors or outdoors, or before leaving the unit unused for extended periods of time, disconnect all equipment from the power source as well as the antenna and cable system.

4 WHEN THE UNIT IS PLUGGED IN

- Never expose the unit to rain or water. **DO NOT OPERATE** if liquid has been spilled into the unit. Immediately unplug the unit, and have it inspected by a service technician. Fire and shock hazards can result from electrical shorts caused by liquid contact inside.
- Never drop or push any object through openings in the unit. Some internal parts carry hazardous voltages and contact can cause electric shock or fire hazard.
- Avoid placing the unit directly above or below your TV set as this may cause electrical interference. Keep all magnets away from electronic equipment.

5 USING ACCESSORIES

Use only accessories recommended by the manufacturer to avoid risk of fire, shock, or other hazards.

6 CLEANING THE UNIT

Unplug the unit. Then, use a clean, dry, chemically untreated cloth to gently remove dust or debris. **DO NOT USE** cleaning fluids, aerosols, or forced air that could over-spray, or seep into the unit and cause electrical shock. Any substance such as wax, adhesive tape, etc. may mar the cabinet surface. Exposure to greasy, humid, or dusty areas may adversely affect internal parts.

SERVICE

1 DO NOT SERVICE THIS PRODUCT YOURSELF

If, after carefully following the detailed operating instructions, this Video product does not operate properly, do not attempt to open or remove covers, or make any adjustments not described in the manual. Unplug the unit and contact a qualified service technician.

2 IF REPLACEMENT PARTS ARE REQUIRED

Make sure the service technician uses only parts specified by the manufacturer, or those having the same safety characteristics as the original parts. The use of unauthorized substitutes may result in fire, electric shock, or other hazards.

3 HAVE THE SERVICE TECHNICIAN PERFORM A SAFETY CHECK

After any service or repairs to the unit, request the service technician to conduct a thorough safety check as described in the manufacture's service literature to ensure that the video unit is in safe operating condition.

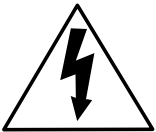
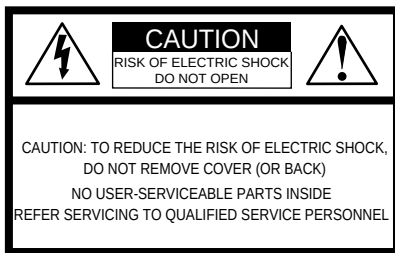
Safety Precautions/Mesures de sécurité

WARNING: To prevent fire or shock hazard, do not expose this equipment to rain or moisture.

CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

Avertissement: Afin de prévenir tout risque d'incendie ou de chocs électriques, ne pas exposer cet appareil à la pluie ou à une humidité excessive.

Attention: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond.



This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.



This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully in order to avoid any problems.

Note to CABLE system installer:

This reminder is provided to call the CABLE system installer's attention to Article 820-40 of the NEC in USA (and to the Canadian Electrical Code in Canada) that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

FCC Warning: Any unauthorized changes or modifications to this equipment would void the user's authority to operate.

Before Using

Congratulations

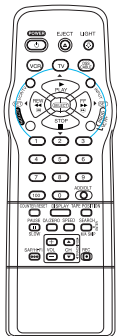
on your purchase of one of the most sophisticated and reliable products on the market today. Used properly, it will bring you years of enjoyment. Please fill in the information below. The serial number is on the tag located on the back of your VCR.

- Date of Purchase _____
- Dealer Purchased From _____
- Dealer Address _____
- Dealer Phone No. _____
- Model No. **PV-VS4821**
- Serial No. _____

Accessories

- ☐ Remote Control

LSSQ0299



- ☐ Batteries 2 "AA"



- ☐ RF Coaxial Cable

VJAS0196



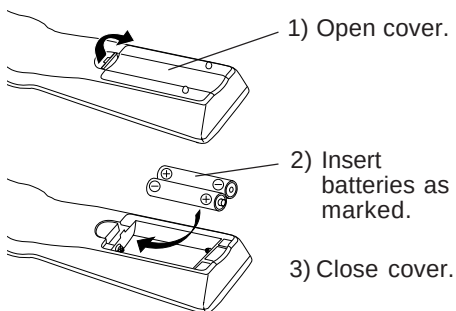
- ☐ S-VHS Connecting Cable

VJAS0200



To order accessories, call toll free 1-800-332-5368.

Loading the Batteries

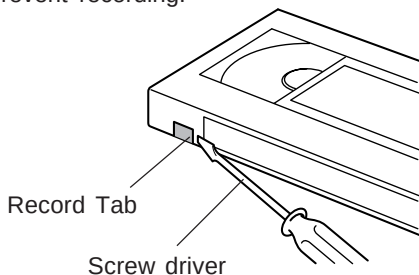


☐ Battery replacement caution

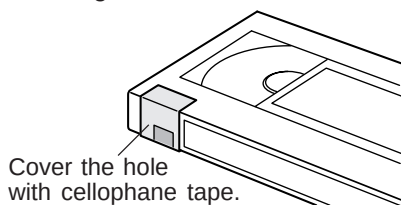
- Do not mix old and new batteries.
- Do not mix alkaline with manganese batteries.

Prevent Accidental Tape Erasure

Break off the tab to prevent recording.



To record again



Record/ Playback Time

Only use tapes with the **VHS** or **SVHS** mark in this unit.

Tape Speed Setting	Type of Video Cassette		
	T60	T120	T160
SP (Standard Play)	1 Hour	2 Hours	2 Hours 40 Minutes
LP (Long Play)	2 Hours	4 Hours	5 Hours 20 Minutes
SLP (SuperLongPlay)	3 Hours	6 Hours	8 Hours

- LP recording is not possible in S-VHS/ S-VHS ET mode.

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Initial Setup
(Connection)

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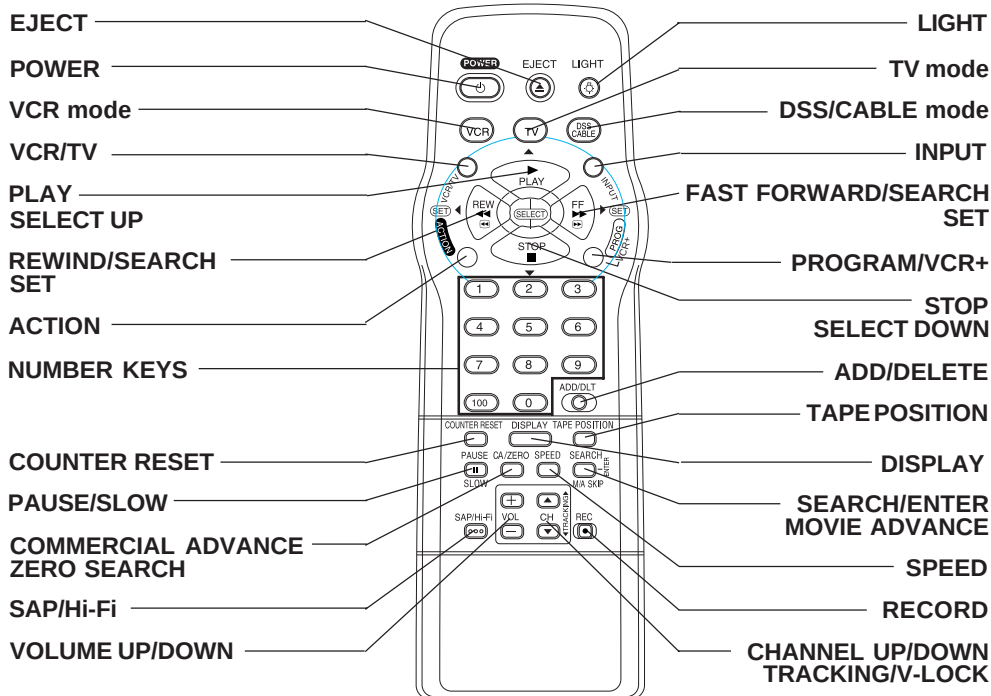
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For Your
Information

Location of Controls

Remote control Buttons

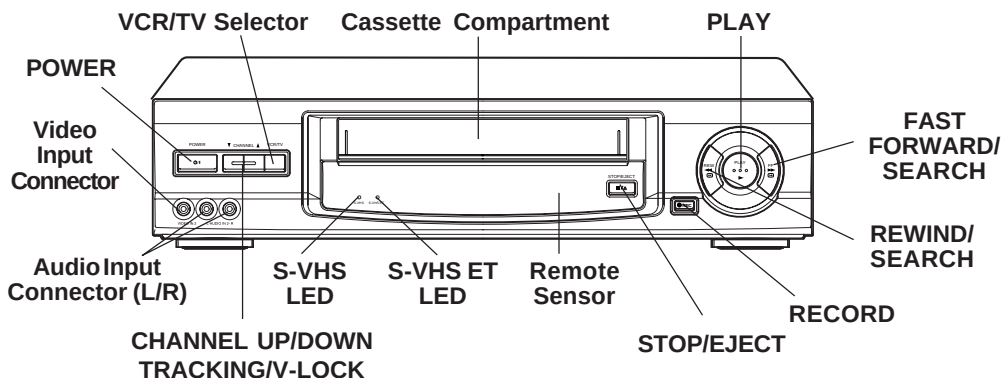


Light Tower Universal Remote Control

Light button: When LIGHT is pressed, available buttons in the selected mode light up and the selected mode button (TV, VCR or DSS/CABLE) flashes for 5 seconds. If no button is pressed, light goes out in 5 seconds to conserve batteries. Also, by holding down a button, you can confirm the selected mode (mode button will flash) in the dark.

EJECT button: Press to eject tape from VCR. If EJECT is pressed during record, VCR will not respond.

Front View of the VCR



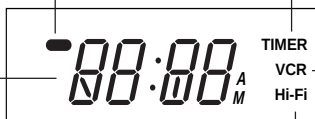
Multi Function Display

Power Indicator

Lights up when power is on.

Timer Indicator

Lights up when the VCR is set for Timer Recording, or when One Touch Recording (OTR) is used. Flashes when Timer Recording is set, but a tape has not been inserted into the VCR and when a power interruption occurs during Timer Programming.



VCR Indicator

Lights up when the VCR/TV selector is set to VCR.

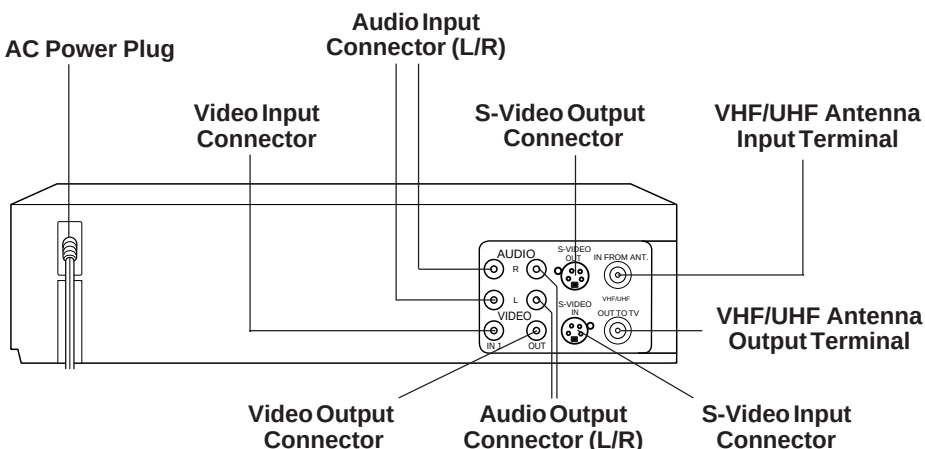
Hi-Fi Indicator

Lights up when Hi-Fi audio is monitored in Playback Mode.

Clock/ Status/ Channel/ Speed Display

Displays the current time. Briefly displays VCR status when a function button is pressed. Briefly displays the channel number, or "L1" or "L2" when a channel or line input is selected. Briefly displays the recording speed when SPEED is pressed.

Rear View of the VCR



Note

- While plugged into an AC outlet, the VCR consumes 3.7 W of electrical power in off mode.

Initial Setup for DSS/CableBox Channel Control

The setup on pages 10 through 15 is vital for proper VCR operation.
Please read the instructions carefully and in the order presented.

NOTE: These first two pages contain reference material needed for setup on pages 10 ~ 15.
Please look over the information before you begin setup procedure.

Setup Overview

You will be performing the following tasks:

- Setting the language you want on-screen displays to appear in (English, Spanish, French).
- Telling the VCR the kind of equipment you use to receive channels and how it is connected.
- Entering pertinent Cable Box or DSS Receiver information if used.
- Entering your local PBS (Public Broadcasting Station) channel so that the VCR can receive auto clock set data. (Not available in all areas.)
- Placing channels in memory and setting the clock.

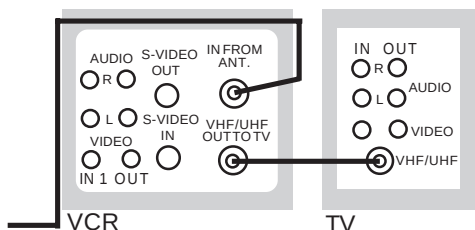
Please Note Which Connection Type You are Using.

Make sure all equipment is hooked up as described on pages 10 ~ 15.
The diagrams below illustrate some of the basic connection types.
Confirm which type you used for later reference.

Connection Type A

(Go to "Initial Setup" on page 10.)

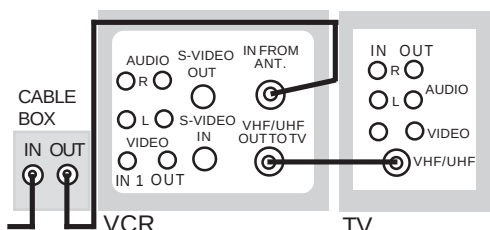
<VCR → TV connection>



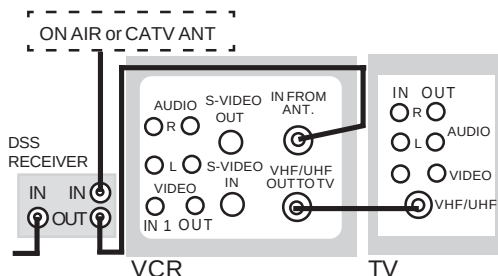
Connection Type B

(Go to "Initial Setup" on page 12.)

<Cable Box → VCR → TV connection>



<DSS Receiver → VCR → TV connection>



INITIAL SETUP IMPORTANT NOTES:

- For detailed DSS Receiver connection instruction, please see your DSS operating manual.
- A DSS Receiver must be turned off to view programs from the Cable Box or antenna.
- Also, the a DSS Receiver must be turned off for auto clock set.
- If your Cable Box is not remote controllable, it must be tuned to your PBS channel.
- If you use Audio/ Video Jack connection between the VCR and Cable Box or DSS Receiver, you must also connect the RF coaxial cable in order to use auto clock set and channel auto set features.

Cable Box/ DSS Receiver Code Number List

If your Cable Box or DSS Receiver is remote controllable, refer to this list during setup on page 13.

Cable Box

Brand	Code Number
Archer	44, 06, 01
Cableview	29, 09, 01, 63
Citizen	44, 52, 30
Curtis	08, 09, 25, 61, 53
Century	44, 51, 75, 59
Cabletenna	29, 09, 01, 63
Cable Cinema	29, 09, 01, 63
Diamond	29, 09, 01, 63
Eagle	62, 40, 22, 13, 58, 20
Eastern	28, 29
Explorer	08, 09, 25, 61, 53
Gemini	30, 04
General Electric	01, 57
General Instruments ..	01, 84, 83, 34, 03, 02, 04, 55, 65, 66, 67, 68
Gerrard	44, 51, 75, 59
GC Electronics	44, 42, 63, 29
Hamlin	41, 14, 15, 28
Hitachi	31
Jerrold	01, 84, 83, 34, 03, 02, 04, 55, 65, 66, 67, 68
Jasco	30, 04
Macom	31
Magnavox	26
Matsushita	17, 16, 08
Movietime	32, 39
Maestro	74, 35
NEC	40, 19, 38, 32
NSC	40, 19, 38, 32
Novavision	08, 09, 25, 61, 53
Next Level	01, 84, 83, 34, 03, 02, 04, 55, 65, 66, 67, 68
Oak	46, 11
Oak Sigma	46, 11
Panasonic	17, 16, 08
Philips	23, 24, 20, 13
Pioneer	06, 05, 12
Pulsar	04, 42
Quest	06, 05, 12
Radio Shack	44, 51, 75, 59

Brand	Code Number
RCA	17, 16, 08
Realistic	44, 51, 75, 59
Recoton	44, 51, 75, 59
Regal	41, 14, 15, 28
Regency	28, 29
Rembrandt	44, 42, 63, 29
Samsung	42, 06, 32
Scientific Atlanta	08, 09, 25, 61, 53
Sheritech	27
Signal	26
SL Marx	42, 06, 32
Sprucer	17, 16, 08
Standard Components	32, 39
Stargate	04, 42
Sylvania	19, 18
Teknika	74, 35
Telecaption	77
Televue	40, 19, 38, 32
Texscan	19, 18
Tocom	34, 33, 01, 42, 66
Toshiba	36
Unika	44, 42, 63, 29
Universal	52, 43, 44, 63
Viewstar	62, 40, 22, 13, 58, 20
Videoway	07, 23, 50
Vidtek	64
Zenith	07, 23, 50

DSS (Digital Satellite System) Receiver

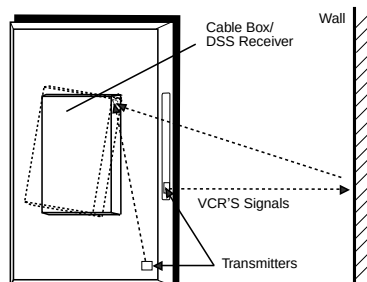
Toshiba	90
Hitachi/ Hughes	91, 99
Primestar	92
Drake	93
Magnavox	94, 95
Uniden	94, 95
Optimus	94, 95
Panasonic	96
ProScan	97
RCA	97
SONY	98, 105

Note

- Some brands list several codes, so you may need to try different codes to attain proper results. These codes are used for Cable Box or DSS Receiver setup for Auto Clock and VCR Plus+ recording only. For TV/ Cable Box Multi-Brand Control operation, please see page 26.

Positioning Your Cable Box or DSS Receiver

If your Cable Box or DSS Receiver is remote controllable, place it on or near the VCR as shown in the example at right. The VCR transmits an infrared signal from two locations. Be sure not to cover the transmitter windows.

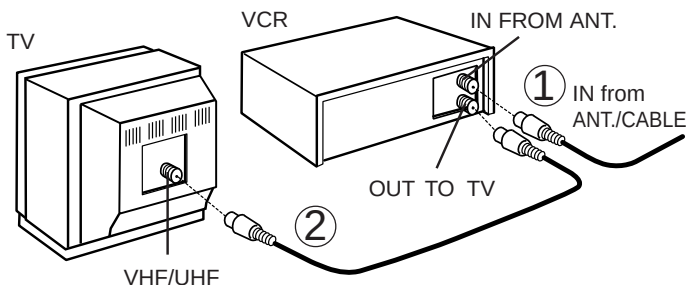


Initial Setup for ANT./Cable-VCR-TV Connection

How to Connect

For Connection Type A [VCR-TV].

- ① Connect the Cable from Antenna/Cable to the IN FROM ANT. terminal on VCR.
- ② Connect the OUT TO TV terminal on the rear of VCR to the ANT. IN terminal on your TV using the RF Cable (included accessory).



How to do Initial Setup

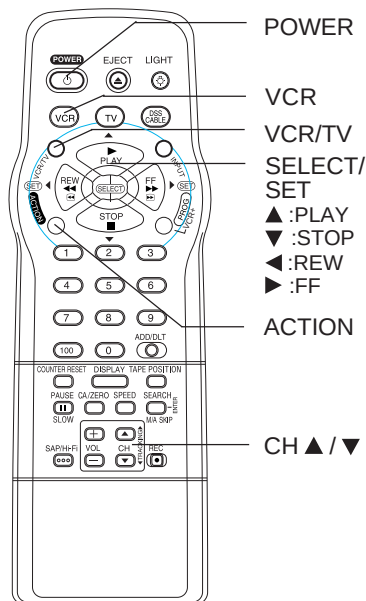
- 1 Press **VCR button*** on the remote for VCR mode.
Turn your TV on and set it to **channel 3**.

- 2 Press **POWER** to turn VCR on.

- 3

SELECT LANGUAGE	
PRESS CH ▲	: ENGLISH
OPRIMIR CH ▼	: ESPAÑOL
APP. VCR/TV	: FRANÇAIS
TO CHANGE VCR'S OUTPUT CH, PRESS ACTION KEY.	

Press **CH ▲** for English.
OR
Press **CH ▼** for Spanish.
OR
Press **VCR/TV** for French.
to select language.



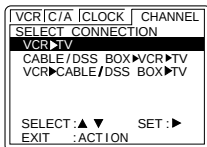
- When VCR is turned on for the first time, **SELECT LANGUAGE** screen appears.
- If wrong language is set, or there is not **Language Display**, do “Reset All VCR Memory Functions” steps on page 11.
- If screen does not appear, check connection between VCR and TV and, if TV is tuned to channel 3, try switching it to channel 4.
- When you want to change the output channel of VCR, please refer to VCR's Output Channel on page 17.

WARNING

When using “Nut type” RF coaxial cables, tighten with fingers only. Overtightening may damage terminals.

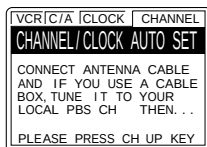
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

4



Press **▲▼** (see right) to select “VCR ► TV” connection and press **►** to set.

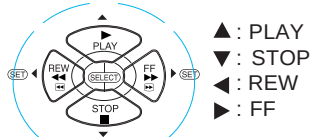
5



Press **CH ▲** to start Channel/Clock Auto Set operation.

Using **▲▼◀▶** keys

You can operate the menu screen using Remote buttons. When menu screens are displayed, the PLAY, STOP, REWIND, and FF buttons on the remote function as **▲▼◀▶**.



**Initial Setup
(Connection)**

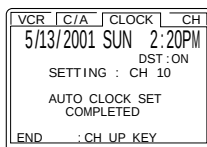
For “CABLE/DSS BOX ► VCR ► TV” connection only.

- Turn on your Cable Box and set it to your Public Broadcasting Station (PBS) channel in your time zone.
- If you use a DSS Receiver, it must be turned off.

6

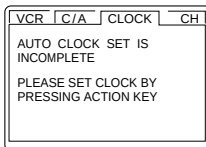
Settings are performed automatically.

Case 1 Setup complete...



Press **CH ▲** to exit.

Case 2 Setup incomplete...



Press **ACTION** to display Manual Clock Set screen.

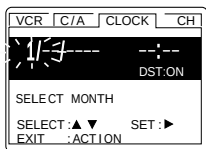
Reset All VCR Memory Functions

Use when moving VCR to new location, or if a mistake was made in the Initial Setup section.

- Make sure a tape is not inserted in the VCR.

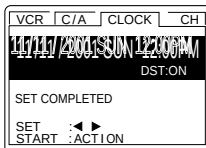


- 1 Turn VCR Power on.
- 2 Press and hold both **PLAY** and **CHANNEL ▲** on the VCR for more than 5 seconds.
 - The power shuts off.
- 3 Do “Initial Setup” on page 10.



Press **▲▼** to select the month and press **►** to set.

- In the same manner, select and set the date, year, time, and DST (daylight saving time).



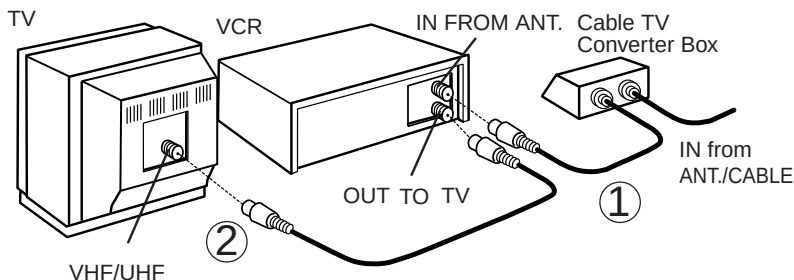
Press **ACTION** twice to start CLOCK and exit.

Initial Setup for DSS/Cable Box-VCR-TV Connection

How to Connect

For Connection Type B [DSS/ Cable Box-VCR-TV].

- 1 Connect the OUT Jack on your Cable Box to the IN FROM ANT. terminal on the VCR with the RF Cable.
- 2 Connect the OUT TO TV terminal on the rear of VCR to the ANT. IN terminal on your TV using the RF Cable (included accessory).



How to do Initial Setup

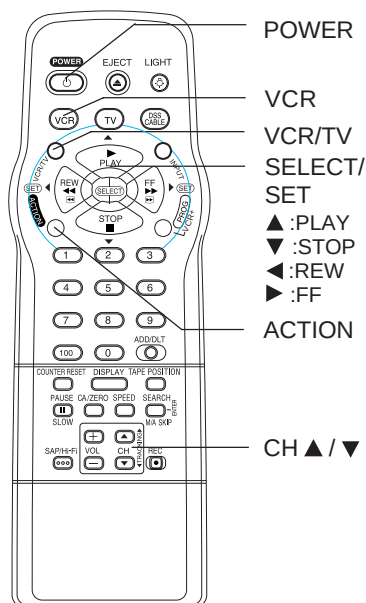
- 1 Press **VCR button*** on the remote for VCR mode. Turn your TV on and set it to channel 3.

- 2 Press **POWER** to turn VCR on.

- 3

Press **CH ▲** for English.
or
Press **CH ▼** for Spanish.
or
Press **VCR/TV** for French.
to select language.

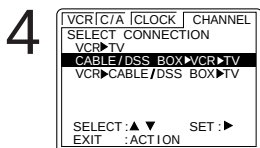
- When VCR is turned on for the first time, SELECT LANGUAGE screen appears.
- If wrong language is set, or there is not Language Display, do "Reset All VCR Memory Functions" steps on page 11.
- If screen does not appear, check connection between VCR and TV and, if TV is tuned to channel 3, try switching it to channel 4.
- When you want to change the output channel of VCR, please refer to VCR's Output Channel on page 17.



WARNING

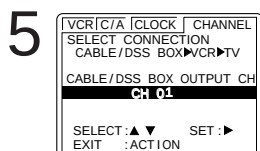
When using "Nut type" RF coaxial cables, tighten with fingers only. Overtightening may damage terminals.

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

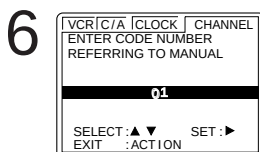


Press ▲▼ (see right) to select
"CABLE/DSS BOX ► VCR ►
TV" connection and
press ► to set.

- Confirm the output channel of your Cable Box or DSS Receiver.

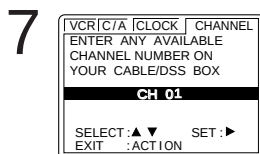


Press ▲▼
to select the same channel
as the Cable Box or DSS
Receiver output channel.
Press ► to enter.

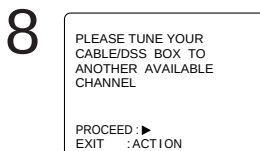


Press ▲▼
to select Cable Box or DSS Receiver code.
(Refer to list, page 9.)
Press ► to set.

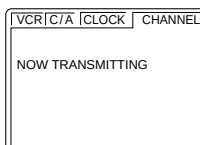
- If Cable Box or DSS Receiver has no remote control, press ▼ to select "NO REMOTE" and press ► to set.
Then, go to **step 5 "CHANNEL/ CLOCK AUTO SET" on page 11.**
- This determines whether VCR will control Cable Box or DSS Receiver.



Press ▲▼
to select any channel your Cable Box or
DSS Receiver receives.
Press ► to set.



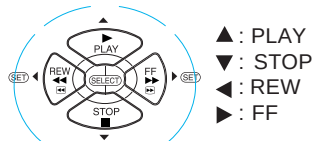
Tune Cable Box or DSS Receiver channel.
Press ► to continue.



"NOW TRANSMITTING" appears.

Using ▲▼◀▶ keys

You can operate the menu screen using Remote buttons. When menu screens are displayed, the PLAY, STOP, REWIND, and FF buttons on the remote function as ▲▼◀▶.

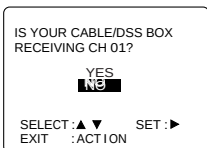


**Initial Setup
(Connection)**

Continued on next page...

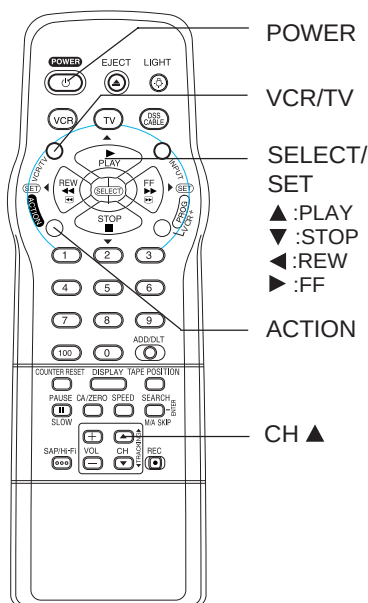
Initial Setup for DSS/Cable Box-VCR-TV Connection

9

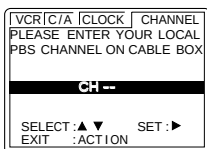


Press ▲▼
to select "YES" or "NO."
Press ► to set.

- If "YES" (with Cable Box), go to step 10.
- If "YES" (with DSS Receiver), go to **step 5** "CHANNEL/ CLOCK AUTO SET" on page 11.
- If "NO," the screen in step 6 will appear. Try entering a different code and/ or repositioning the equipment (see page 9.)
- If still "NO," Cable Box or DSS Receiver is not available. Press ACTION. Then, go to **step 5** "CHANNEL/ CLOCK AUTO SET" on page 11.

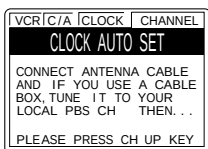


10



Press ▲▼
to select channel on which
Cable Box receives your
local Public Broadcasting
Station(PBS).
Press ► to set.

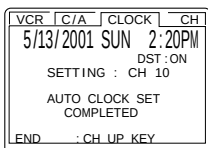
11



Press CH ▲
to start Clock Auto Set.

- "AUTO CLOCK SET PROCEEDING" appears.

12



Confirm that time is correct.
Press CH ▲
to exit.

14

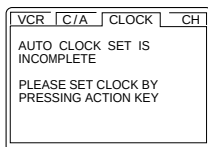
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

If displayed time is incorrect...

If your area observes DST (daylight saving time), but the time is incorrect; do **“Time Zone Adjust”** steps on page 17.

Or, if you use Cable Box and receive more than one PBS station, try auto clock set again entering the one you have not tried yet.

(Go to **“Clock”** on page 16.)

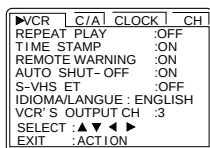


If appears **“AUTO CLOCK SET IS INCOMPLETE”** on-screen...

Auto clock set data is not available in your area.

Press ACTION to display Manual Clock Set screen, and then go to **step 6 (case 2)** on page 11.

To setup VCR in case a Cable Box or DSS Receiver was installed or replaced.



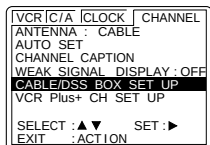
a Press ACTION to display MENU.

b Press ◀▶ to select CHANNEL.

c Press ▲▼ to select **“CABLE/ DSS BOX SET UP”**, then **press ▶**.

d Press ▲▼ to select **“CABLE/ DSS BOX ▶ VCR ▶ TV”**, then **press ▶** to set.

e Continue with steps 5 ~ 9 on pages 13, 14.

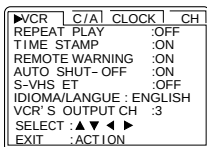


Note

- Auto clock set will be performed when VCR is turned off the first time each day. Therefore, Cable Box must be left on.

Reset Language, Channels, Clock

1

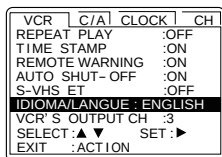


Press ACTION*
to display MENU.

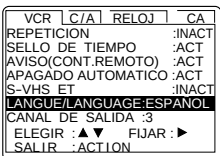
2

Language

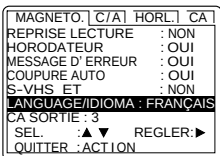
- 1) Press ▲▼ to select language item.



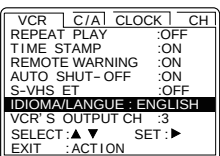
- 2) Press ▶ repeatedly.



For Spanish



For French

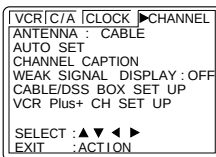


For English

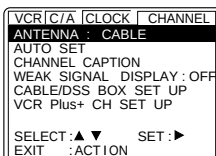
- 3) Press ACTION to exit.

Channels

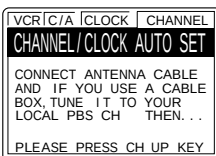
- 1) Press ◀▶ to select CHANNEL.



- 2) Press ▲▼ to select "ANTENNA," then press ▶ to set your antenna system (TV or CABLE).



- 3) Press ▲▼ to select "AUTO SET," then press ▶.



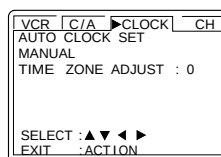
(This screen appears only when auto clock is set.)

- 4) Press CH ▲.

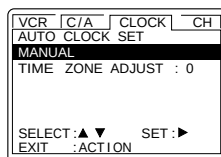
- After Channel Auto Set is finished, Clock Auto Set will be performed.

Clock

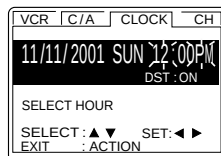
- 1) Press ◀▶ to select CLOCK.



- 2) Press ▲▼ to select MANUAL and press ▶. (For Auto Clock Set, select "AUTO CLOCK SET," then press CH ▲.)



("TIME ZONE ADJUST" appears only when auto clock is set.)

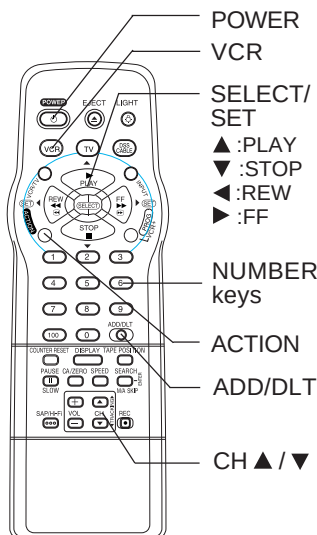


- 3) Press ▲▼ and ◀▶ to select and set the date, time, and DST (Daylight Saving Time).

- 4) Press ACTION twice to start the clock and exit this mode.

VCR's Output Channel

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.



Basic Operation

Time Zone Adjust

(Only when Auto Clock is set.)

- 1) Press ◀▶ to select CLOCK.

VCR	C/A	CLOCK	CH
AUTO CLOCK SET			
MANUAL			
TIME ZONE ADJUST : 0			
SELECT : ▲▼▶◀			
EXIT : ACTION			

- 2) Press ▲▼ to select TIME ZONE ADJUST

VCR	C/A	CLOCK	CH
AUTO CLOCK SET			
MANUAL			
TIME ZONE ADJUST : 0			
SELECT : ▲▼ SET : ▶◀			
EXIT : ACTION			

and press ◀ or ▶ to subtract or add hour(s) as necessary.

- 3) Press ACTION.

- 4) Press POWER off and wait a maximum 10 minutes until AUTO CLOCK SET is performed by the VCR.

- TIME ZONE ADJUST returns to "0" if clock is set manually.

VCR's Output Channel

- 1) Press ▲▼ to select VCR'S OUTPUT CH.

VCR	C/A	CLOCK	CH
REPEAT PLAY : OFF			
TIME STAMP : ON			
REMOTE WARNING : ON			
AUTO SHUT-OFF : ON			
S-VHS ET : OFF			
IDIOMA/LANGUE : ENGLISH			
VCR'S OUTPUT CH : 3			
SELECT : ▲▼ SET : ▶			
EXIT : ACTION			

- 2) Press ▶.

VCR	C/A	CLOCK	CH
IF YOU PRESS ACTION KEY, VCR'S OUTPUT CH SWITCHES TO CH 4.			

- 3) Press ACTION.

VCR	C/A	CLOCK	CH
PLEASE TUNE YOUR TV TO CH 4.			

After 3 seconds

VCR	C/A	CLOCK	CH
REPEAT PLAY : OFF			
TIME STAMP : ON			
REMOTE WARNING : ON			
AUTO SHUT-OFF : ON			
S-VHS ET : OFF			
IDIOMA/LANGUE : ENGLISH			
VCR'S OUTPUT CH : 4			
SELECT : ▲▼ SET : ▶			
EXIT : ACTION			

- To Make Corrections, repeat steps 1) ~ 3).

Add or Delete a Channel

To add channel:

Select channel with number keys and press ADD/DLT.

CHANNEL 08 ADDED

To delete channel:

Select channel with CH ▲ / ▼ or number keys and press ADD/DLT.

CHANNEL 08 DELETED

DST (Daylight Saving Time)

VCR auto adjusts clock for DST. (Page 11.)

Spring (First Sunday in April)

DST:ON --> Sets clock ahead one hour.

Autumn (Last Sunday in October)

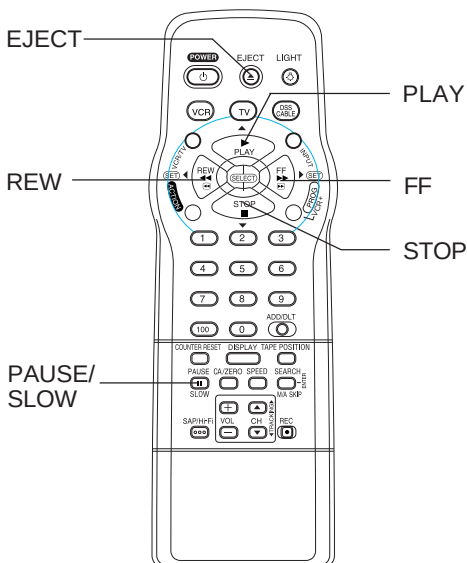
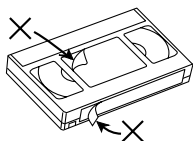
DST:ON --> Turns clock back one hour.

- If your area does not observe Daylight Saving Time, select DST:OFF.
- Keep these time changes in mind when programming the VCR for timer recordings.

Playback a Tape

Note

Remove loose or peeling labels from tapes to prevent tape jam.



Playback using VCR controls

1 Insert a tape.

2 Press PLAY.



Multi Function Display

■ Press STOP/EJECT to stop and/ or eject tape.



Ready Check List

- ☐ All connections are made (pg. 10, 12, 28).
- ☐ TV and VCR are plugged in.
- ☐ TV is on and tuned to CH3, 4, or VIDEO.
- ☐ Remote is in VCR mode. (Press VCR.)

1 Insert a tape.

- VCR power comes on.
- “VCR” lights up on Multi Function Display.

2 Press PLAY*

to play a tape.

- If tape has no rec. tab (pg. 4), auto play begins.

Special Features During Play

■ Forward/ Reverse scene search

- > Press FF or REW.
- > Press again or PLAY to release.

■ Still (Freeze) picture

- > Press PAUSE/SLOW.
- > Press PLAY to release.

■ Frame by Frame picture

- > Press PAUSE/SLOW in Still mode.
- > Press PLAY to release.

■ Slow Motion picture

- > Hold down PAUSE/SLOW in Still mode.
- > Press PLAY to release.

Notes

- These features work best in SP or SLP mode.
- The sound will be muted.
- To reduce picture noise, see “Manual Tracking Control” on page 46.
- After the VCR is in Still or Slow mode for 3 minutes, it will switch to Stop mode automatically to protect the tape and the video head.

3 Press STOP

to stop a tape.

Rapid Rewind/FF

■ Press REW or FF in Stop mode

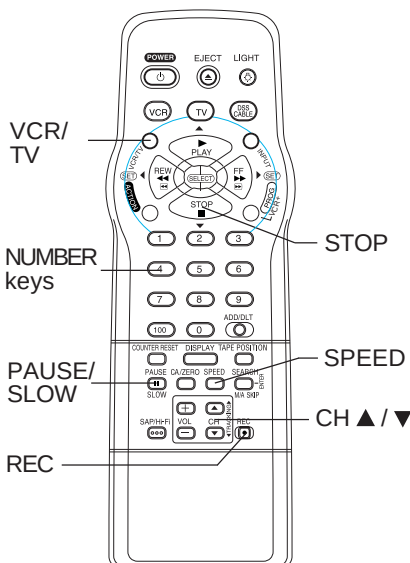
- to rewind/ fast forward a tape.
- Rewind tapes in approximately one minute when using a T-120 tape.

■ Press EJECT on the remote,

- or STOP/EJECT on VCR to eject a tape.

Record on a Tape

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.



Ready Check List

- ☐ All connections are made (pg. 10, 12, 28).
- ☐ TV and VCR are plugged in.
- ☐ TV is on and tuned to CH3, 4, or VIDEO.
- ☐ Remote is in VCR mode. (Press VCR)

1 Insert a tape with a record tab (pg. 4).

- VCR power comes on.
- "VCR" lights up on Multi Function Display.

2 Press CH ▲▼, or number keys to select the channel.

- For "LINE" input, see pg. 44.
- For channels over 100, press 100 key then press the remaining 2 digits.

3 Press SPEED to select the record speed (pg. 4).

SP = Standard Play LP = Long Play
SLP = Super Long Play

- LP recording is not possible in S-VHS/ S-VHS ET mode.
- Speed appears on-screen and on Multi Function Display.

4 Press REC to start recording.

- To edit out unwanted scenes, press PAUSE/SLOW to pause, and again to resume recording.
- You cannot view another channel during recording.

5 Press STOP to stop recording.

■ One Touch Recording (recording in progress),

- VCR shuts off after the preset record length.
- > each press of REC adds 30 min. to the record length up to 4 hours.

■ Record one station, watch another,

- > press VCR/TV ("VCR" goes out on Multi Function Display),
- > select channels at TV (recording continues).

■ Select channels at VCR,

- > press VCR/TV ("VCR" lights up on Multi Function Display),
- > select channels at VCR.

Notes

- **Watching one channel and recording another is NOT possible when using a Cable Box or a Satellite Receiver.**
- After 5 min. in Pause mode, VCR stops to protect tape and video head.

Record using VCR controls

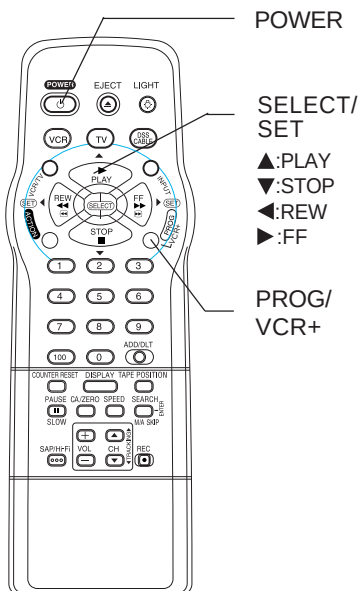
- 2 Select Channel.
- 1 Insert a tape.
- 4 Press REC to start Recording.



- 5 Press STOP/EJECT to stop.

This video recorder, equipped with the HQ (High Quality) System, is compatible with existing VHS equipment. Only use those tapes with the **VHS** or **SVHS** mark. It is recommended that only tapes tested and inspected for use in 2, 4, 6, and 8 hour VCR machines be used. This video recorder is equipped with recording functions for both conventional **VHS** and **SVHS** systems to enable users to select either mode. An **SVHS** cassette recorded in the **SVHS** mode cannot be played back with conventional **VHS** VCRs.

Timer Recording

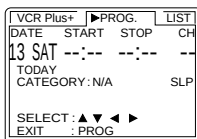


Ready Check List

- ☐ All connections are made (pg. 10, 12, 28).
- ☐ TV and VCR plugged in and turned on.
- ☐ VCR/TV selector set to "VCR."
- ☐ Clock set correctly.
- ☐ Tape has rec. tab (pg. 4).
- ☐ Remote is in VCR mode. (Press VCR)

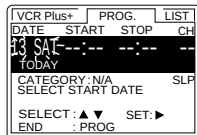
1 Press PROG/VCR+ button* to display PROGRAM.

2



Press ▼ to display Program screen.

3



1) To set record DATE, press ▲▼ to select: 1 ~ 31= one time, or DAILY= MON ~ FRI, or WEEKLY= same time each week and press ► to set.

• See selection order below left.

2) To set remaining items, press ▲▼ to select and press ► to set START/STOP times, CH (channel) or LINE input (pg.44), Category** and tape speed (SP, LP, SLP).

Press PROG/VCR+ button to end the program.

Example

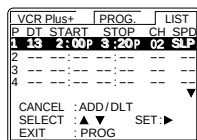


**Category Items
N/A (not applicable),
SPORTS, MOVIE,
COMEDY, MUSIC, DRAMA

Notes

- If you are using a Cable Box, VCR Timer Programming the Cable Box power must be left on.
- If a power interruption occurs while programming the timer, the timer program(s) may be canceled. If "TIMER PROGRAMS WERE LOST DUE TO POWER INTERRUPTION" appears on-screen, please reenter the timer programs.

4



To Enter More Programs, press ▲▼ to select and press ► to set an unused program number and repeat step 3.

Or

Press PROG/VCR+ button to exit.

5

Press POWER off

to set the timer.

("TIMER" lights up on Multi Function Display.)

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Review, Replace or Clear Program Contents:

(Recording is not in progress)

1

VCR Plus+	PROG.	LIST
P	DT	START STOP CH SPD
1	7	9:00A 12:00A 08 SP
2	8	10:00P 12:00P 02 SP
3	10	8:00P 9:00P 10 SP
4	SU	9:00P 10:00P L1 LP

SELECT: ▲▼◀▶
EXIT : PROG

- 1) Press **PROG/VCR+** button.
- 2) Press **◀▶** to select LIST.

To cancel a Timer Recording in progress...

Press **POWER** and then press **STOP** within 10 seconds to cancel the Timer Recording. (The **TIMER** indicator goes out from Multi Function Display.)

2

VCR Plus+	PROG.	LIST
P	DT	START STOP CH SPD
1	7	9:00A 12:00A 08 SP
2	8	10:00P 12:00P 02 SP
3	10	8:00P 9:00P 10 SP
4	SU	9:00P 10:00P L1 LP

CANCEL : ADD/DLT
SELECT : ▲▼ SET: ▶
EXIT : PROG

- Press **▲▼** to select number.

3

To Replace program...

VCR Plus+	PROG.	LIST
DATE	START	STOP CH
7	SUN	9:00A 12:00A 08
TODAY		
CATEGORY: N/A		
SELECT START DATE		
SELECT : ▲▼ SET: ▶▶		
END : PROG		

- 1) Press **▶** to display.
- 2) Repeat Step 3 (pg.20) to set new program.

or

To Clear program...

VCR Plus+	PROG.	LIST
P	DT	START STOP CH SPD
1	8	10:00P 12:00P 02 SP
2	10	8:00P 9:00P 10 SP
3	SU	9:00P 10:00P L1 LP

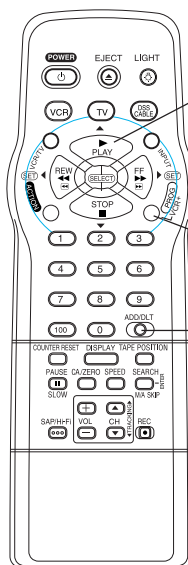
CANCEL : ADD/DLT
SELECT : ▲▼ SET: ▶
EXIT : PROG

- Press **ADD/DLT**.

4

Press **PROG/VCR+** button to end the program.

- If there are set programs, press **POWER** off to set timer.



SELECT/
SET

▲ :PLAY
▼ :STOP
◀ :REW
▶ :FF

PROG/
VCR+

ADD/DLT

Timer
Recording

Important notes when using a DSS Receiver

- When recording programs via a DSS Receiver, the DSS Receiver must be left on.
- When recording programs via an antenna or cable, the DSS Receiver must be turned off.

Timer Recording Using VCR Plus+® System

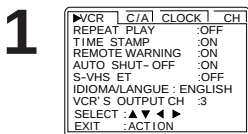
Auto VCR Plus+ System Channel Setup (Part 1)

In order for VCR to read PlusCode numbers, some setup is required. Guide channel numbers are assigned to each local broadcast and cable station.

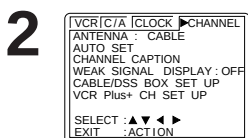
Because this number sometimes differs from the channel your TV receives the station on, it is necessary to program the VCR with local channel information.

To receive VCR Plus+ channels automatically, perform the steps below.

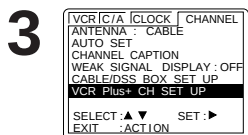
Or, see "Manual VCR Plus+ System Channel Setup" section on page 24.



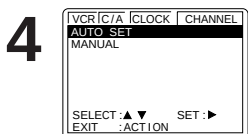
Press ACTION*
to display MENU.



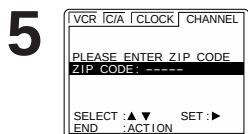
Press ◀▶
to select CHANNEL.



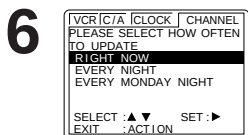
Press ▲▼
to select
VCR Plus+ CH SET UP and
press ▶ to display.



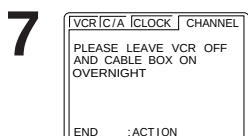
Press ▲▼
to select AUTO SET and
press ▶ to set.



Press ▲▼◀▶
to enter Zip Code and
enter each number.
Press ▶ or ACTION to set.



Press ▲▼
to select When to
Update and
press ▶ to set.



Press ACTION to end.

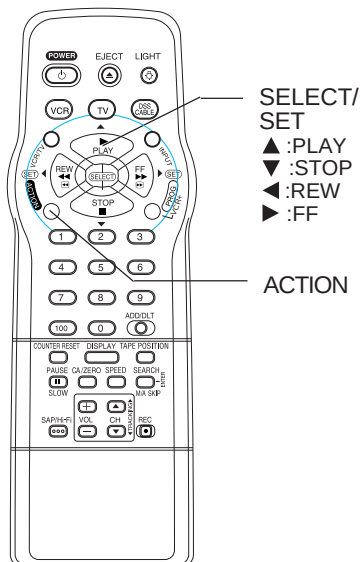
- Make sure to leave VCR off (overnight). If controllable, leave your Cable Box on.

VCR Plus+ System is ...

a feature that allows you to set **most items** of a timer recording by simply entering a special code number (PlusCode programming number) found in TV GUIDE and selected newspaper TV listings.

Important Note

- "Initial Setup" on pages 8 ~ 15 must be completed before "Auto VCR Plus+ System Channel Setup" can be done. If any part of setup is incomplete, a warning screen appears.



Notes

- Make each entry within 5 minutes, or VCR will leave this mode.
- Once local channels have been programmed, they will stay in memory, even in the case of a power failure.
- If the start time for a timer recording comes up during Auto VCR Plus+ System Channel Setup, the timer recording will have priority.

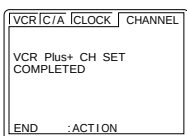
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Auto VCR Plus+ System Channel Setup (Part 2)

Before you perform the following steps, you should have:

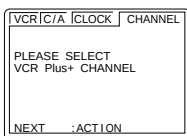
- completed “Auto VCR Plus+ System Channel Setup (Part 1)” on page 22.
- left VCR off overnight, and turned it back on after 9:00 AM the next day.

1 If channel updating was successful...



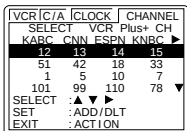
Press **ACTION** to exit this mode.

If VCR could not distinguish channel map...



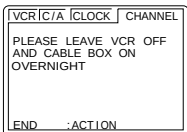
Press **ACTION** to display **SELECT VCR Plus+ Channel**. Continue with step 2.

2



Press **▲▼◀▶** to select channel map for your area and press **ADD/DLT** to set.

3



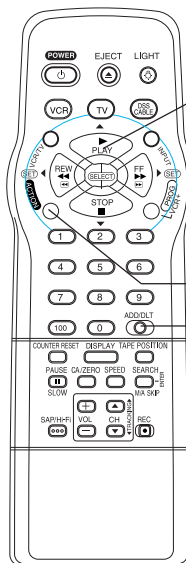
Press **ACTION** to end.

- Make sure to leave VCR off (overnight). If controllable, leave your Cable Box on.

Channel map will be updated (overnight). If it was successful, “VCR Plus+ CH SET COMPLETED” appears on screen. And then, press **ACTION** to exit.

Repeat these steps as necessary.

If Auto Setup fails, do “Manual VCR Plus+ System Channel Setup” on page 24.



SELECT/SET
▲:PLAY
▼:STOP
◀:REW
▶:FF

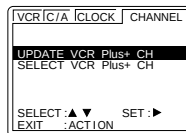
ACTION
ADD/HLT

Timer
Recording

To Change or Update Auto VCR Plus+ System Channel Setup

(E.g. you selected wrong channel map or zip code.)

- a Do “Auto VCR Plus+ System Channel Setup (Part 1)” steps 1 ~ 4 on page 22.



- b Press **▲▼** to select **UPDATE VCR Plus+** or **SELECT VCR Plus+ CH**, then press **▶**.
- c If you selected **UPDATE VCR Plus+ CH**, perform steps 5 ~ 7 in the “Auto VCR Plus+ System Channel Setup (Part 1)” section on page 22.

If you selected **SELECT VCR Plus+ CH**, perform steps 2 ~ 3 in the “Auto VCR Plus+ System Channel Setup (Part 2)” section on this page.

Timer Recording Using VCR Plus+® System (continued)

Initial Setup.....

In order to use Timer Recording Using VCR Plus+ System, the Initial Setup on page 8 to 15 must be completed for setting Clock and Channel.

Channel Setup.....

Since numbers assigned to channels found in TV Guide and selected newspapers may differ from channels in your viewing area, you'll need to enter your local TV channel number for each corresponding Guide Channel.

If you perform the VCR Plus+ Channel set up procedures shown below, you will be able to perform timer recordings using the PlusCode programming number listed in your local TV listing.

Manual VCR Plus+ System Channel Setup

For [VCR-TV] or [VCR-Cable Box-TV] connection only.

To complete step 5 of setup, do the following:

- Prepare a TV/Cable station line-up and channels they are received on. Also, the Guide channel numbers assigned to your stations (found in TV Guide and selected newspapers).

- Make a 3-column chart (see sample).

Left column

--> all stations you receive.

Middle column

--> each station's assigned Guide channel number from TV Guide, etc.

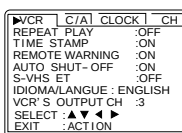
Right column

--> channel number on which your TV receives the station.

SAMPLE ONLY

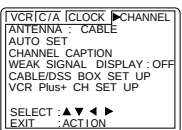
Broadcast or Cable station name	Assigned Guide channel No.	Channel No. on which my TV receives the station.
HBO	33	15
Nickelodeon	38	20
CBS	04	04
FOX	11	

1



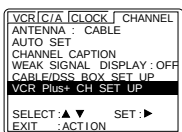
Press **ACTION*** to display menu.

2



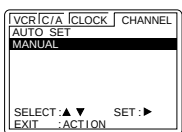
Press **◀▶** to select **CHANNEL**.

3



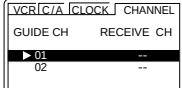
Press **▲▼** to select **VCR Plus+ CHANNEL SETUP**, and press **▶** to set.

4

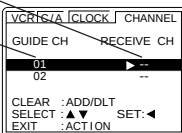


Press **▲▼** to select **MANUAL**, and press **▶** to set.

5



To enter VCR Plus+ channels, press **▶** to move cursor to right, press **▲▼** to enter number, press **◀** to set, and press **▲▼** to scroll up/down.



- Repeat step 5 until list is complete.

To Make Corrections,

press **▲▼** and **▶** to move to error, then **▲▼** to change, or **ADD/DLT** to erase number.

6

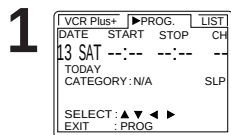
Press **ACTION** twice to end setup.

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

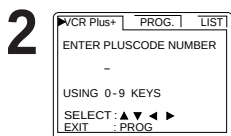
VCR Plus+ System Programming

✓ Ready Check List

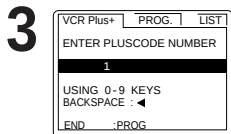
- ☐ Clock is set.
- ☐ VCR Plus+ Setup is complete (see pages 22 ~ 24).



Press PROG/VCR+ button to display PROGRAM.



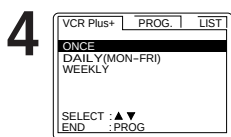
Press ◀▶ to select display VCR Plus+ screen.



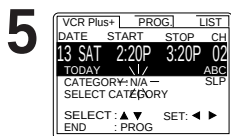
Press number keys to enter PlusCode number and press PROG/VCR+ button to set.

To Make Corrections, press ◀ repeatedly to delete number, then repeat step 3.

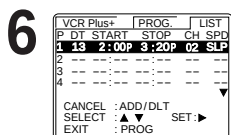
- If the PlusCode number entered begins with "0", skip to step 5. Display in step 4 will not appear.



Press ▲▼ to select ONCE, DAILY (MON-FRI), or WEEKLY record frequency and press PROG/VCR+ button to set.



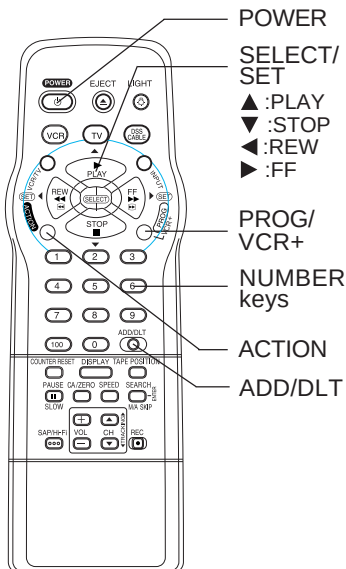
Press ▲▼ to select Category and record speed. Press ▶ to set. Press PROG/VCR+ button to end program.



Press PROG/VCR+ button to exit.

- **Press ADD/DELETE to delete the program.**

7 Press POWER off to set the timer.
(“TIMER” lights up on Multi Function Display.)



Do normal Timer Record if...

- PlusCode number is not listed for program.
- the program (e.g. sports event) may run over set stop time.

See page 21 to:

- cancel a timer recording in progress.
- review, replace, or clear program contents.

Important for DSS/ Cable Box Users

- When recording via DSS, the receiver must be left on. When recording via cable or antenna, DSS Receiver must be off.
- When recording via a Cable Box, leave box on.

Notes

- Do not overlap program times.
- PlusCode numbers cannot be used to program VCR to record DSS and Cable Box channels.
- Make each entry within 1 minute or the VCR will exit setup mode.
- Once VCR Plus+ channel setup is done, channels stay in memory. If a power interruption occurs, VCR Plus+ channel setup may be lost. Please do VCR Plus+ channel setup again.
- Obtain unlisted PlusCode numbers by calling 1 - 900 - 454 - 7587. Call costs about \$.95 per minute.

Timer Recording

Multi-Brand Control Feature

Multi-Brand Control Setup

The Remote Control can be set to control some TV and Cable box/DSS functions.

1 Find your TV and Cable Box/DSS Receiver Brand Code Number on following page.

2 ■ Setup for TV control, -->hold down TV button, -->enter code with number keys.

■ Setup for Cable or DSS control, -->hold down DSS/CABLE button, -->enter code with number keys.

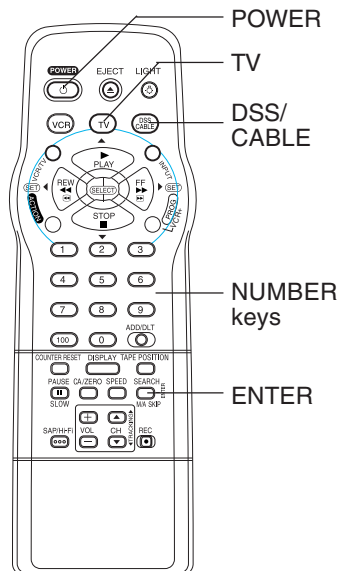
- If code number is 100 or greater,
-->press 100 key, then other digits.
E.g., press 100 - 0 - 2 for 102.

3 Confirm code entry, -->press POWER to turn selected unit on or off.

- See table below for controllable functions in each mode.

Notes

- Repeat setup after remote battery replacement.
- Remote will not control every TV, cable box, or DSS made by the manufacturer listed. If you get no response, your particular unit cannot be controlled. There are NO additional codes for the products listed. If your product is not listed, then the remote is not compatible with that product.



Using Multi-Brand Control

After remote is set up, you can select VCR, TV, or DSS/CABLE for the desired function.

Press VCR, or TV, or DSS/CABLE on the remote.
(Table below shows available unit buttons for each mode.)

Unit Mode	VCR	TV	CABLE/DSS
VCR	All	VOL UP/DOWN	_____
TV	VCR/TV, PLAY, STOP, EJECT, SAP/Hi-Fi, DISPLAY, FF, REW, PAUSE/SLOW, REC, SPEED, CA/ZERO, COUNTER RESET, TAPE POSITION	POWER, INPUT, number keys, ENTER, CH UP/DOWN, VOL UP/DOWN	_____
CABLE/DSS		VOL UP/DOWN	POWER, ENTER, number keys (except 100key), CH UP/DOWN

Notes

- Not all functions listed may be controllable.
- In TV or DSS/CABLE mode, it may be necessary to press ENTER after pressing number keys for channel selection.

TV Brand Code Numbers

Panasonic	01, 02	Sylvania	05	JVC	11
Quasar	01, 02	Sharp	06, 07	Hitachi	12
RCA	03	Sony	08	Mitsubishi	07, 13
GE	03	Toshiba	09	Samsung	14
Zenith	04	Sanyo	10	Gold Star	15, 16, 17
Magnavox	05	Fisher	10		

Cable Box Brand Code Numbers

Archer	05, 06, 01, 44, 63, 91, 126	Quest	05, 06
Cabletenna	01, 44, 63, 91, 126	Radio Shack	51, 44, 59, 75, 126
Cableview	63, 44, 42, 30, 52, 04, 124, 126	RCA	16, 17, 97, 109
Century	51, 44, 59, 75, 126	Realistic	51, 44, 59, 75, 126
Citizen	63, 44, 42, 30, 52, 04, 124, 126	Recoton	51, 44, 59, 75, 126
Curtis	08, 09, 61, 53, 87	Regal	14, 15, 28, 41, 102, 103, 104, 108, 130
Diamond	01, 44, 63, 91, 126	Regency	28, 130
Drake	67	Rembrandt	01, 32, 39, 42, 44, 63, 126
Eagle	13, 22, 58, 62, 20, 40, 26, 107	Salora	68
Eastern	28, 130	Samsung	05, 32, 40, 42, 06
GC Brand	63, 44, 42, 30, 52, 04, 124, 126	Scientific Atlanta	08, 09, 61, 53, 87
Gemini	04, 124	Sheritech	27
General Electric	57, 01	Signal	26, 112
General Instruments	01, 02, 03, 04, 34, 55, 83, 106, 65, 67, 68, 115, 117, 118, 124, 91	SL Marx	32, 40, 42, 06, 43, 44, 52, 63, 126
Hamlin	14, 15, 28, 41, 102, 103, 104, 108, 130	Sprucer	16, 17, 97, 109
Hitachi	31	Standard Components	32, 39, 42, 44, 126
Jasco	04, 124	Stargate	32, 40, 63, 44, 42, 30, 52, 04, 06, 124, 126
Jerrold	01, 02, 03, 04, 34, 55, 83, 106, 65, 67, 68, 115, 117, 118, 124, 91	Sylvania	19
Macom	31	Teknika	74
Magnavox	26, 112	Telecaption	77, 127
Matsushita	16, 17, 97, 109	Televue	32, 40, 42, 06
Movietime	32, 39, 42, 44, 126, 38, 40	Texscan	18, 19
NEC	38, 40, 32	Tocom	33, 34, 01, 42, 66, 91
NOVAVISION	08, 09, 61, 53, 87	Toshiba	36
NSC	38, 40, 32	Uniden Satellite	65
Oak	46, 11, 129	Unika	01, 44, 63, 91, 126
Oak Sigma	46, 11, 129	Universal	42, 43, 44, 52, 63, 126
Panasonic	16, 17, 97, 109	Videoway	07, 23, 50, 129
Philips	07, 13, 20, 23, 24, 50, 128, 129	Vid Tech	64
Pioneer	05, 06	Vidtek	64
Pulsar	63, 44, 42, 30, 52, 04, 124, 126	Viewstar	13, 22, 58, 62, 20, 40, 26, 107
		Zenith	07, 23, 50, 129

DSS Brand Code Numbers

Toshiba	92	Panasonic	96
Hitachi/ Hughes	93	RCA	97
Magnavox/ Uniden 1	94	Sony	98, 105
Magnavox/ Uniden 2	95		

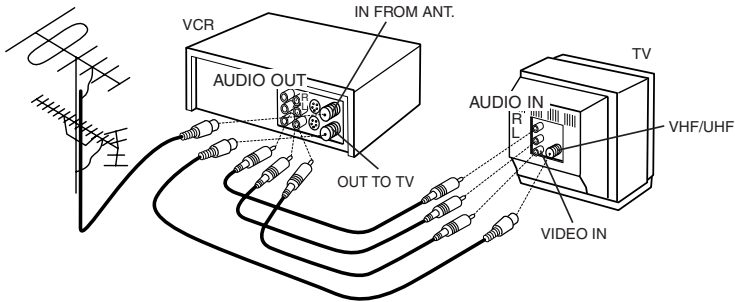
Important Notes

- Due to changes in infra-red commands used by manufacturers, some brands have several codes. If your unit does not respond to the first code, please try the next one.
- Some TV, Cable Box and DSS Receiver brands require you to turn on the power manually.

Advanced Connections

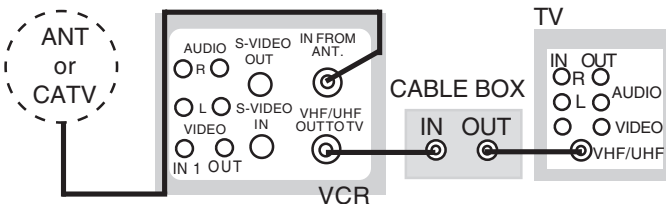
Audio/Video Connection

If your TV has AUDIO IN and VIDEO IN terminals, you can connect the VCR to them to receive higher quality picture and sound.



- 1 Connect the VIDEO OUT terminal on the VCR to the VIDEO IN terminal of your TV.
- 2 Connect the "L" and "R" AUDIO OUT terminals on the VCR to the "L" and "R" AUDIO IN terminals of your TV.
- 3 Set the VIDEO/TV selector of your TV (Monitor/Receiver) to "VIDEO."

■ With a Cable Box (VCR → Cable Box)



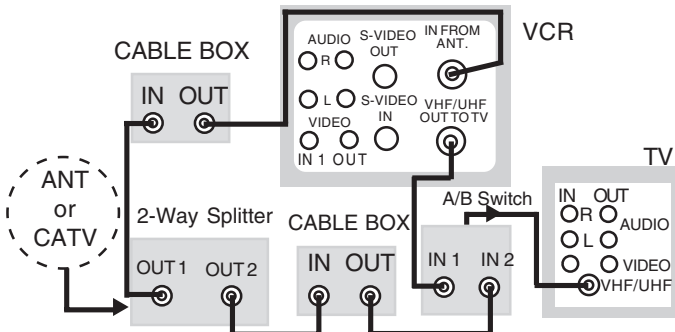
You Can

- view any (including scrambled) channel.
- use the VCR Remote to select channels without using Multi-brand control feature.

You Cannot

- record scrambled channels.

■ Connect With Two Cable Boxes



You Can

- record and view both scrambled and unscrambled channels if additional equipment is added. This connection requires: two converter boxes, an A/B switch, and a 2-way splitter.

You Cannot

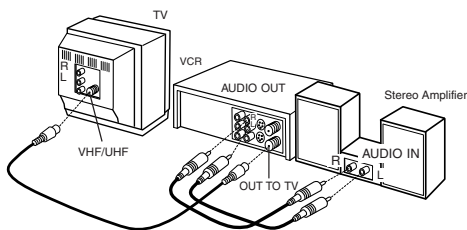
- view channel other than the one selected for any type of recording.
- do a Timer recording of a channel unless you select it on the cable box.

MTS Broadcast/VHS Hi-Fi Stereo System

Connection

Make the Audio/Video Connection as shown on the previous page.

- You can use a TV connected to Stereo amp and speakers instead of a Stereo TV.



Receivable Broadcast Types

The following are possible audio broadcast types and on-screen displays.

The signal being received is indicated with an "K" mark while the selected audio mode is indicated with an arrow.

To display the broadcast signal being received, --> **press DISPLAY**.

MTS Stereo and SAP broadcast

Multi-channel Television Sound Stereo (main language) and Secondary Audio Program (sub language) broadcasts are being received simultaneously. Select STEREO or SAP audio mode.

MTS Stereo broadcast

Multi-channel Television Sound Stereo broadcast. Select STEREO audio mode.

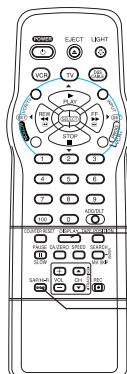
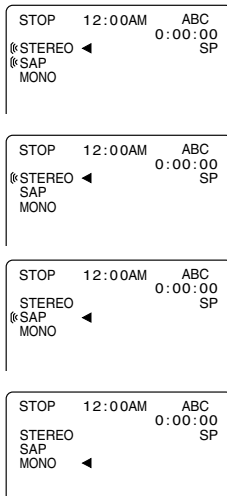
- If stereo broadcast is weak and display flickers, select MONO audio mode for possibly better results.

SAP broadcast

Secondary Audio Program (sub language) broadcast. Select SAP audio mode for the sub language.

MONO broadcast

Normal monaural sound broadcast.



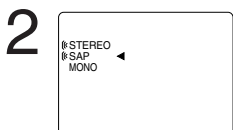
DISPLAY

SAP/
Hi-Fi

Equipped with **dbx**[®]-TV Noise Reduction for true MTS reproduction. **dbx**[®]-TV Noise Reduction is required for good stereo separation and audio fidelity. **dbx**[®] is a registered trademark, and is licensed by **dbx**[®] Technology Licensing.

Audio Mode for Recording

- Press SAP/Hi-Fi** to display audio mode.
(Display disappears after 5 seconds.)



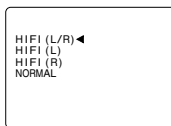
Press SAP/Hi-Fi repeatedly to select desired mode.

- Refer to "Receivable Broadcast Types" above.

- Do a recording.**
See page 19.

Audio Mode for Playback

- Start playback.**
See page 18.
- Press SAP/Hi-Fi** to display audio mode.
(Display disappears after 5 seconds.)
- Press SAP/Hi-Fi repeatedly** to select desired mode.



- Arrow indicates selection.

- Select "HIFI (L/R)" or "HIFI (L)" or "HIFI (R)" to listen to stereo recordings in stereo sound. Select "NORMAL" for monaural sound.

Notes

- Only tapes recorded in Hi-Fi stereo will playback with true stereo sound. Standard stereo tapes will playback in monaural sound.
- To listen to Hi-Fi stereo playback, the VCR AUDIO (L/R) jacks must be connected to a stereo TV or an external stereo amp and speakers. (See top of this page.)
- If tracking is adjusted during playback, Hi-Fi audio may revert to normal audio.
- Hi-Fi and normal audio playback volume level may differ.

Advanced
Operation

Tape Operation

COMMERCIAL▶▶ADVANCE®

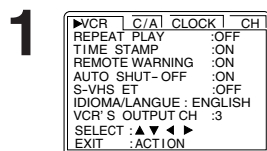
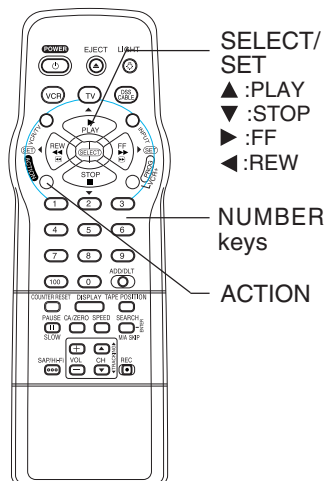
COMMERCIAL▶▶ADVANCE® detects and marks the beginning and end points of commercials on your tape for recordings over 15 minutes in length. When a COMMERCIAL▶▶ADVANCE® marked tape is played back, the VCR automatically advances through the commercial segments at high speed. You can also set this feature to Manual so as to have more control over the advance process. The effectiveness of this system can vary due to differences in the way television stations broadcast. See page 32 for answers to the most commonly asked questions about this feature.

COMMERCIAL▶▶ADVANCE® Marking

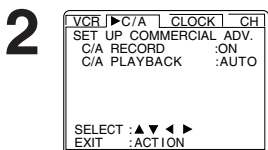
When C/A RECORD: ON, VCR automatically rewinds the tape after a recording has been made and marks the beginning and end of any detected commercial blocks. After marking is done, the tape is returned to the end of the recording. Commercials are not erased from the tape.

Ready Check List

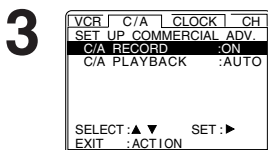
- ☐ All connections are made.
- ☐ One time Setup completed.
- ☐ VCR is plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on TV.



Press ACTION*
to display MENU.



Press ◀▶
to select C/A
and display SET UP
COMMERCIAL ADV.



Press ▲▼
to select C/A RECORD
and
press ▶ to set.

Note

- When using the timer to record two adjacent shows on the same channel, better accuracy can be obtained by programming each shows separately.

ON Timer, VCR Plus+ System, and One Touch recordings are marked automatically.

THE VCR IS WAITING TO
MARK COMMERCIALS IN
THE PROGRAM YOU RECORDED.

MARKING
NOW : PRESS 1
LATER : PRESS 2
CANCEL : PRESS ACTION

When STOP is pressed during normal recording,
Select one of a) or b) or c).

- a) Press 1 key to mark the recording now.
"NOW MARKING COMMERCIALS" appears.
- b) Press 2 key to mark the recording later (after the power has been turned off).
- If the tape is rewound and another recording started before the power is turned off, commercials may not be marked correctly.
- c) Press ACTION to cancel the marking of this recording.

OFF The VCR will not mark commercials.

When you are editing or dubbing a tape, or when you do not wish to use this feature, OFF should be selected.

4 **Press ACTION**
to return to normal screen.

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

COMMERCIAL▶▶**ADVANCE**® Playback

When playing back a recording which has been marked using the **COMMERCIAL▶▶ADVANCE**® feature, you can either set VCR to automatically advance through marked commercial blocks, or set it so that commercials are only skipped on your command.

1

VCR	C/A	CLOCK	CH
REPEAT PLAY	:OFF		
TIME STAMP	:ON		
REMOTE WARNING	:ON		
AUTO SHUT-OFF	:ON		
S-VHS ET	:OFF		
IDIOMA/LANGUE	:ENGLISH		
VCR'S OUTPUT CH	:3		
SELECT	▲▼◀▶		
EXIT	:ACTION		

Press ACTION
to display MENU.

2

VCR	C/A	CLOCK	CH
SET UP COMMERCIAL ADV.			
C/A RECORD	:ON		
C/A PLAYBACK	:AUTO		
SELECT	▲▼◀▶		
EXIT	:ACTION		

Press ◀▶
to select C/A
and display SET UP
COMMERCIAL ADV.

3

VCR	C/A	CLOCK	CH
SET UP COMMERCIAL ADV.			
C/A RECORD	:ON		
C/A PLAYBACK	:AUTO		
SELECT	▲▼	SET	▶
EXIT	:ACTION		

Press ▲▼
to select C/A
PLAYBACK
and
press ▶ to set AUTO or
MANUAL.

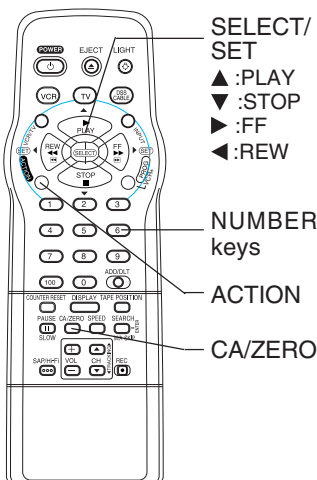
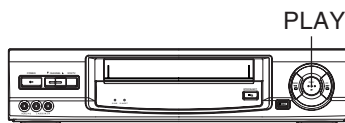
AUTO VCR will automatically advance through marked commercial blocks recorded on the tape and then resume playback.

MANUAL VCR will advance through commercials only when CA/ZERO is pressed. Playback will resume when the end mark of a commercial block is found, or a new recording or blank portion is detected, or after 8 minutes.

4 Press ACTION
to return to normal screen.

Notes

- The selection mode in step 3 remains set unless there is a power outage in which case the original factory setting will be restored.
- If playback is started in the middle of a commercial, only a single commercial is shown, or an individual commercial is longer than 1 minute, the commercial may not be skipped. Press FF to quickly advance through the commercial.
- Part of a recorded program may be skipped over if the program portion between commercials is less than one minute or there are frequent dark and quiet scenes during the program. To view the portion of tape being incorrectly skipped, press PLAY while the VCR is skipping, reverse the tape to a point just prior to where the skipping began and press PLAY again. This time the group will not be automatically skipped. Automatic skipping will be re-enabled when the end of the marked group is detected.



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MOVIE▶▶ADVANCE® are
registered trademarks of SRT, Inc.
A Jerry Iggulden invention licensed
in association with Arthur
D. Little Enterprises, Inc.
U.S.Pat. No. 5,333,091;
5,692,093; 5,696,866
other patents pending

**Advanced
Operation**

Tape Operation (continued)

The most commonly asked questions about **COMMERCIAL**↔**ADVANCE**® are answered below.

Question	Answer
How fast does the VCR advance through commercials?	The VCR advances through a 3-minute commercial block in about 8 to 12 seconds if the tape speed is SLP. In SP, it takes about 25 to 35 seconds.
Are commercials advanced through only when I playback a recording?	Yes. The commercials are not marked until after the recording is finished.
Are commercials still recorded on the tape in case I choose to view them sometime?	Yes. By setting the C/A PLAYBACK to MANUAL (see page 31), you can view or advance through commercials as desired.
Does COMMERCIAL ↔ ADVANCE ® work in all recording speeds?	Yes. COMMERCIAL ↔ ADVANCE ® works in SP, LP, and SLP.
Does the VCR advance through commercials each time I playback tapes which were recorded using COMMERCIAL ↔ ADVANCE ®?	Yes. As long as C/A PLAYBACK is set to AUTO (see page 31), the VCR should advance through commercials each time the tape is played back.
After marking commercials, does the VCR stop at the end of the tape, or rewind to the beginning?	The tape stops at the end of the recording so that any additional timer recordings can be performed.
Can I play my COMMERCIAL ↔ ADVANCE ® recordings in non- COMMERCIAL ↔ ADVANCE ® VCRs?	Yes. COMMERCIAL ↔ ADVANCE ® marked recordings will play in non- COMMERCIAL ↔ ADVANCE ® VCRs, but commercials will not be advanced through.
Does the marking process interfere with other programmed recordings?	No. If the interval between 2 or more timer programs is not sufficient to mark the recording, marking will be done after all recordings are complete and the power goes off.
What happens if I cancel the marking in progress so I can use the VCR?	Marking will be resumed when the VCR's power is turned off as long as the tape has not been ejected.
What if part of my program is advanced through along with the commercials?	Please see the 3rd note on page 31.
Additional Notes: • Because of the various ways in which commercials are broadcast, the VCR may not be able to recognize all commercials. • If a timer recording is scheduled for the middle of the night, please be aware that the VCR will make some noise as it rewinds and fast forwards the tape while marking commercials.	

COMMERCIAL↔**ADVANCE**® and **MOVIE**↔**ADVANCE**® are registered trademarks of SRT, Inc.
A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc.

U.S.Pat. No. 5,333,091;
5,692,093; 5,696,866
other patents pending

***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

MOVIE **ADVANCE**®

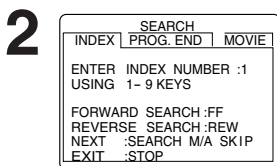
MOVIE **ADVANCE**® helps you locate certain parts of prerecorded movies (rented or purchased).

The feature works in two ways.

- You can go to the beginning of the movie.
- You can skip from one preview to the next.

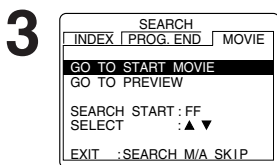
MOVIE **ADVANCE**® works only on cassettes recorded in SP speed with the record tab removed.

1 Insert a cassette without record tab.



Press **SEARCH/ M/A SKIP*** to display **SEARCH**.

- If you inserted a cassette with the record tab or if you selected "INDEX SEARCH" go to page 34.



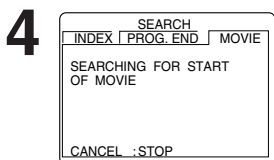
Press **SEARCH/ M/A SKIP** twice to select **MOVIE** and press **▲▼** to select **GO TO START MOVIE** or **GO TO PREVIEW**.

Select **"GO TO START MOVIE."** if you want to advance directly to beginning of the movie.

--> continue with step 4.

Select **"GO TO PREVIEW."** if you want to view the first (next) preview.

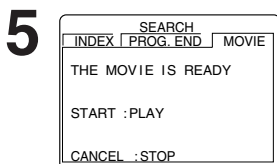
--> go to "To Search for Preview" at right.



Press **FF** to start searching.

- To cancel, press **STOP**.

When the movie is found...

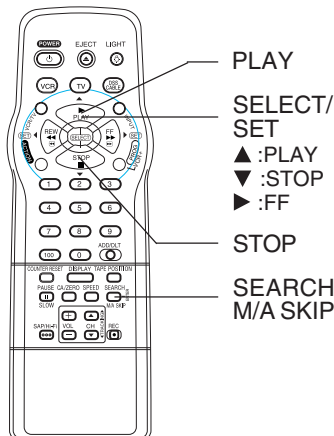


Press **PLAY** to start playback.

- To cancel, press **STOP**.

Ready Check List

- ☐ All connections are made.
- ☐ One time Setup completed.
- ☐ VCR is plugged in.
- ☐ TV is turned on and set to CH3, 4 or Video on TV.



To Search for Preview.

You can override the operation of MOVIE **ADVANCE**® SEARCH FOR PREVIEWS mode by pressing **SEARCH/ M/A SKIP** during tape searching.

MOVIE **ADVANCE**® works by searching the tape past each preview and then reversing back to the start of the detected preview. While the tape is reversing back, if **SEARCH/ M/A SKIP** is pressed, MOVIE **ADVANCE**® will begin searching for the next preview. While searching for the next preview, if you see the start of a preview which you wish to watch, press **SEARCH/ M/A SKIP** and MOVIE **ADVANCE**® will immediately reverse back to the start of that preview, instead of searching further past the preview start point.

Once the VCR is playing a preview, press **SEARCH/ M/A SKIP** to advance to the next preview, long commercial or the start of the movie (whichever is next).

1 Start preview searching.

- 1) In step 3 at left, select "Go To PREVIEW".

- 2) Press **▶**.

- If you want to playback, press **PLAY**.

When a preview is detected, VCR will start playback.

2 Start next preview searching.

- Press **SEARCH/ M/A SKIP**.

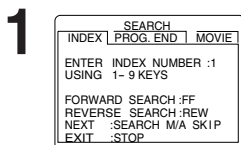
- To cancel, press **STOP**.

Tape Operation (continued)

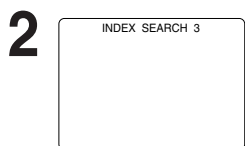
Search System

For each recording, an invisible index mark is placed on the tape.
A program index and information are also included for timer recordings.
These marks are used to access or scan recordings.

Index Search



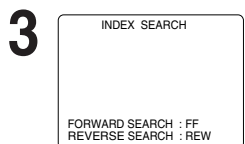
Press **SEARCH/ M/A SKIP*** to display **SEARCH** in Stop or Play mode.



Press number keys to select recording number.

- To calculate number, see below.

Press **FF** or **REW** to start search.

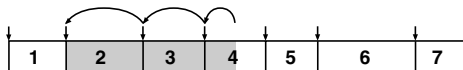


- Play begins at search end. To search forward or back 1 index, press **FF** or **REW** while screen left is displayed (10 sec.).

To Calculate Index Number

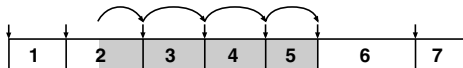
Example 1:

To go to rec. 2 from rec. 4, enter 3 and press **REW**.



Example 2:

To go to rec. 6 from rec. 2, enter 4 and press **FF**.



NOTE: ↓ indicates start points of each recording.

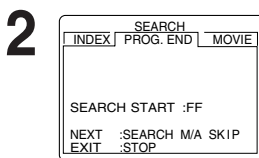
Note

- If Index Search is started very close to an index mark, that index mark may not be counted in the search.

Program End Search

Locates end point of recording for continuity.

1 Press **SEARCH/ M/A SKIP** twice to display **SEARCH** in Stop or Play mode.



Press **FF** to start **PROGRAM END SEARCH**.

Examples of **Program End Search**.

Fig. 1

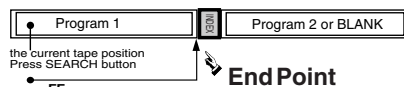


Fig. 2

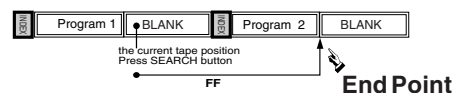
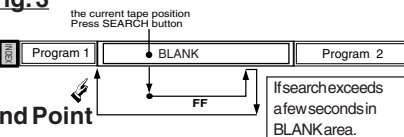


Fig. 3



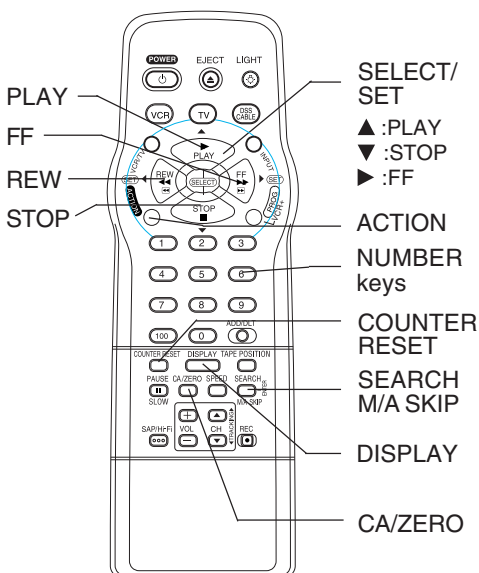
Upon locating end point,

- >search continues 7 sec. past end point,
- >tape rewinds to 10 sec. before end point,
- >tape plays to end point and stops.

Notes

- If Program End Search is started very close to an index mark, that mark may be skipped over.
- To cancel, press **PLAY** or **STOP**.

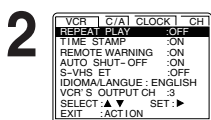
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.



Repeat Play

Set to playback a recording over and over.

1 Press **ACTION** to display MENU.



Press **▲▼** to select REPEAT PLAY and press **▶** to set ON or OFF.

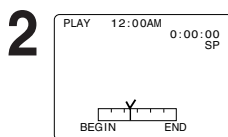
- Play repeats at tape end or if unrecorded portion over 30 seconds is detected.

3 Press **ACTION** to return to normal screen.

Zero Search

To quickly return to a specified tape location.

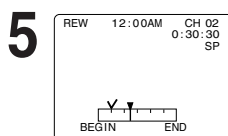
1 Press **DISPLAY** during play to display Counter.



Press **COUNTER RESET** at desired position to reset to "0:00:00".

3 Continue to record, playback etc.

4 Press **STOP**.



Press **CA/ZERO** in Stop mode to start ZERO SEARCH.

- Unit will go into FF or REW mode and stop at the last point the Counter was set to 0:00:00.

Note

- If a blank portion exists on the tape, and depending on the position of the V mark, the V mark display position may not be accurate.

Auto Operation Functions

Auto Play

Insert tape --> Power comes on, --> Play starts if no record tab (see pg. 4).

Auto Rewind

Play
Manual Record } --> Tape end,
Fast Forward } --> Rewind

Play Auto Eject

(Repeat Play must be off)

Play, --> Tape end, --> Rewind,
--> Tape ejects if no record tab

Special VCR Features

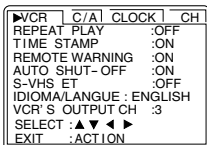
Channel Caption

When set, station name, e.g. ABC, CBS, and channel number appear on-screen. Set up to 24 preset captions, and/or 10 manually created captions.

☐ You need a list of stations and the channel numbers you receive them on.

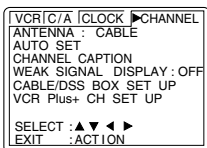
Preset Caption

1



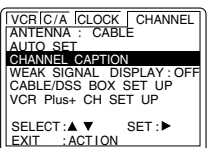
Press **ACTION***
to display MENU.

2



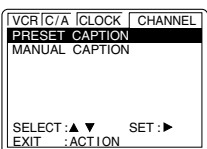
Press **◀▶**
to select CHANNEL.

3



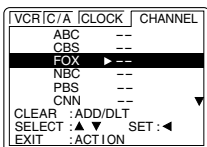
Press **▲▼**
to select CHANNEL
CAPTION and
press **▶** to set.

4



Press **▲▼**
to select PRESET
CAPTION and
press **▶** to set.
• To create your own
captions, go to "Manual
Caption" on page 37.

5



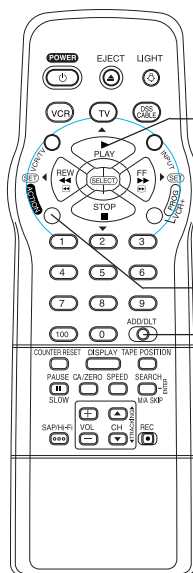
Assign preset captions.
1) Press **▲▼** to highlight
caption.
2) Press **▶** to move
cursor to the right.
3) Press **▲▼** to select CH
number.
4) Press **◀** to set.
• Repeat step 5 until the
list is complete.

To make corrections,

Press **▲▼** and **▶** to select the channel number, then
press **▲▼** to change, or ADD/DLT to delete the number.

6

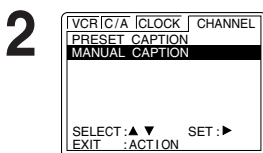
Press ACTION twice
to end setup.



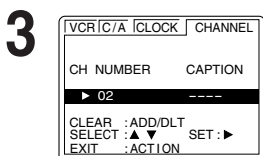
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Manual Caption

1 Do “Preset Caption” steps 1 ~ 3 on page 36.

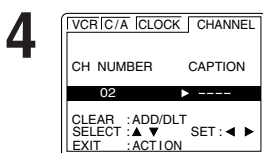


Press **▲▼**
to select **MANUAL**
CAPTION and
press **►** to set.



Press **▲▼** to
select **CH NUMBER**
and
press **►** to move cursor
to the right.

- Channels already set and channels deleted from Channel Memory are not displayed.
- You can set a total of ten channel captions.



Press **▲▼**
to enter **CAPTION** and
press **◀** to set.

- Characters change in following order.

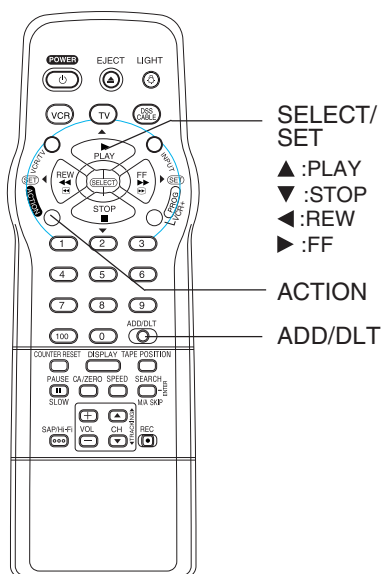
→A↔B↔C↔...↔Z↔BLANK↔-↔&↔
→9↔...↔2↔1↔0↔+↔!↔

- Repeat steps 3 and 4 as desired.

To make corrections,

Press **◀▶** to move to the incorrect entry, then
press **▲▼** to make correction.
Or, press **ADD/HLT** to clear the caption.

5 Press **ACTION** twice
to end setup.



Special VCR Features (continued)

Time Stamp Feature

The VCR writes program data (see example below) about the first 10 seconds of every recording.

The information is then displayed the first 10 seconds of playback.

1

VCR	C/A	CLOCK	CH
REPEAT PLAY	:OFF		
TIME STAMP	:ON		
REMOTE WARNING	:ON		
AUTO SHUT-OFF	:ON		
S-VHS ET	:OFF		
IDIOMA/LANGUE	: ENGLISH		
VCR'S OUTPUT CH	:3		
SELECT	:▲▼◀▶		
EXIT	:ACTION		

Press **ACTION*** to display MENU.

2

VCR	C/A	CLOCK	CH
REPEAT PLAY	:OFF		
TIME STAMP	:ON		
REMOTE WARNING	:ON		
AUTO SHUT-OFF	:ON		
S-VHS ET	:OFF		
IDIOMA/LANGUE	: ENGLISH		
VCR'S OUTPUT CH	:3		
SELECT	:▲▼◀▶	SET:▶	
EXIT	:ACTION		

Press **▲▼** to select TIME STAMP and to select ON or OFF and press **▶** to set.

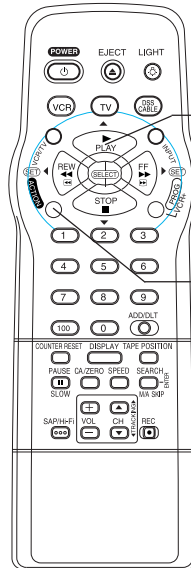
- When "OFF" is selected, the program data is written on the tape, but will not be displayed.

3

Press **ACTION** to return to normal screen.

Ready Check List

- ☐ Clock is set to correct time.
- ☐ Record tab in place. (See page 4.)



SELECT/SET

▲:PLAY
▼:STOP
◀:REW
▶:FF

ACTION

<Time Stamp Example>

One Touch Recording

11/11/2001 SUN
12:00PM
CH 08 ABC

Timer Recording

11/11/2001 SUN
12:00PM - 1:00PM
CH 08 ABC MOVIE

When Clock is not set...

--/--/--
--:--
CH 08 ABC

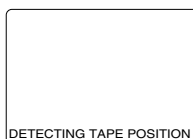
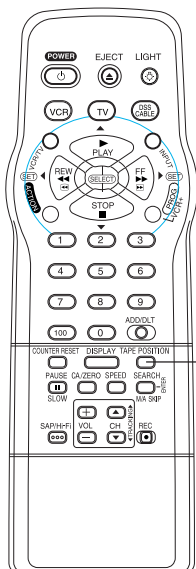
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Tape Position and Tape Status Feature

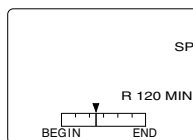
To find out the present tape position and amount of tape remaining.

Tape position cannot be detected for VHS-C Cassettes, tapes under 30 minutes, and some other tapes.

1 Press TAPE POSITION to detect current tape position.



- “DETECTING TAPE POSITION” is displayed only when a cassette is first inserted, and it takes several seconds for correct tape position to appear.



- The present tape position indication and amount of tape remaining (according to tape speed) is displayed.
- Tape remaining time display may not be precise.

2 Press TAPE POSITION to return to normal screen.

Note

- This function cannot display exact amount of tape remaining for tapes 30 minutes or less, or for tapes over 120 minutes in length.

Special VCR Features (continued)

VCR Lock Feature

When set to ON, all operations except for timer record and tape eject are prohibited. Useful for households with small children.

VCR LOCK ACTIVATED

To turn on,
hold down REC on the
VCR in Stop mode with no
tape inserted for 7 sec.
(Please ignore the NO
CASSETTE warning.)



REC

VCR LOCK OFF

To turn off,
repeat above.

- VCR Lock cancels in 24 hours if clock is set.

Auto Shut-Off Feature

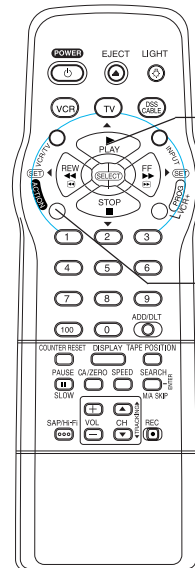
When set to ON, VCR shuts off if blank tape is played or no signal is detected for 5 minutes.

1 Press ACTION*
to display menu.

2 Press **▲▼**
to select
AUTO SHUT-OFF and
press **▶**
to set ON or OFF.

VCR	C/A	CLOCK	CH
REPEAT PLAY	:OFF		
TIME STAMP	:ON		
REMOTE WARNING	:ON		
AUTO SHUT-OFF	:ON		
S-VHS EI	:OFF		
IDIOM/LANGUAGE : ENGLISH			
VCR'S OUTPUT CH : 3			
SELECT: ▲▼	SET: ▶		
EXIT	:ACTION		

3 Press ACTION
to return to normal screen.



SELECT/
SET

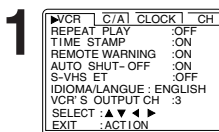
▲:PLAY
▼:STOP
▶:FF

ACTION

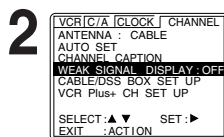
***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Weak Signal Display ON/OFF Feature

When "ON," picture is displayed regardless of signal strength.



Press ACTION
to display menu.



Press ◀▶
to select and
display CHANNEL,
press ▲▼
to select WEAK
SIGNAL DISPLAY,
and
press ▶
to set ON or OFF.

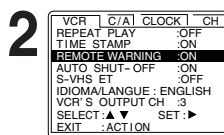
- ON: Picture is displayed regardless of signal condition, and may not always be clearly visible.
- OFF: Screen turns solid blue when signal is weak or non-existent.
- Selecting ON has no effect on connected equipment with blue back feature.

3 Press ACTION
to return to normal screen.

Remote Warning ON/OFF Feature

If Multi-brand feature is used (page 26), and this feature is set to on, a warning appears whenever an invalid key is pressed in TV, DSS, or Cable mode.

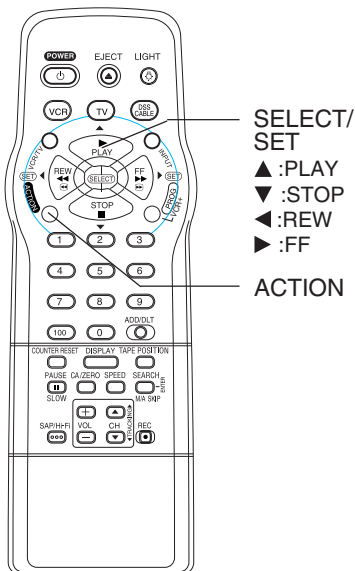
1 Press ACTION
to display menu.



Press ▲▼
to select REMOTE
WARNING and
press ▶
to set ON or OFF.

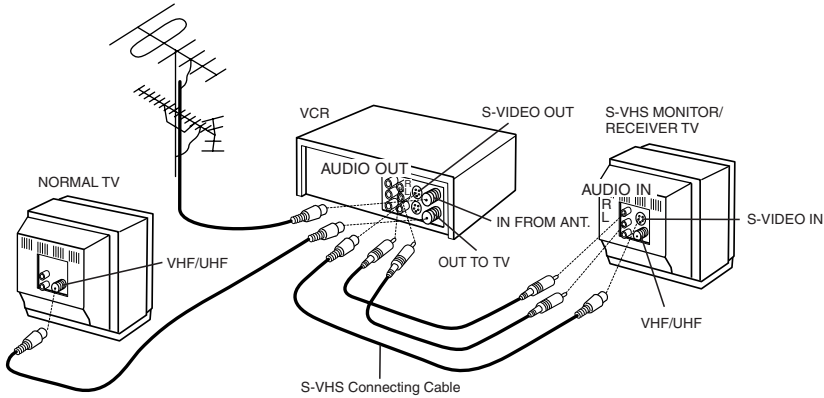
- If "OFF," remote warning will not appear if invalid key is pressed.

3 Press ACTION
to return to normal screen.

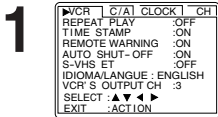


Super (S) VHS System

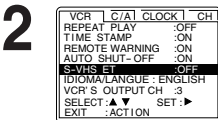
S-VHS tape playback is superior to VHS, even when using a conventional TV. And, your S-VHS VCR can also playback VHS format tapes.



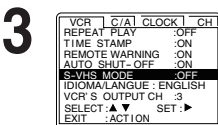
Selecting the S-VHS/ S-VHS ET System



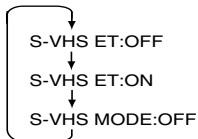
Press **ACTION*** to display MENU.



Press **▲▼** to select S-VHS ET.

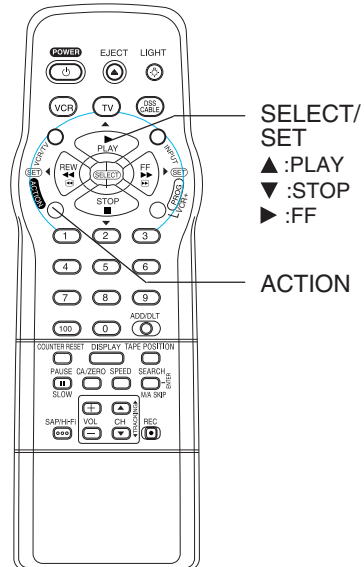


Press **►** repeatedly. Display will change as below.



When S-VHS ET turns on or off, S-VHS mode turns on. See next page for details.

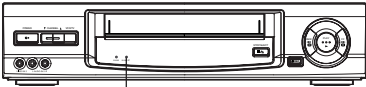
4 Press **ACTION** to return to normal screen.



***Important:** If a remote control button does not work when pressed, press the VCR button on the remote and try the button again.

Super VHS ET

Your VCR is equipped with S (Super) VHS ET. This facility allows recording with S-VHS picture quality on VHS cassettes. You can then playback S-VHS ET recordings on a VCR equipped with S-VHS ET.



S-VHS ET indicator

- The “S-VHS ET” indicator lights up on the front display panel.

Notes

- S-VHS ET does not work with S-VHS tapes.

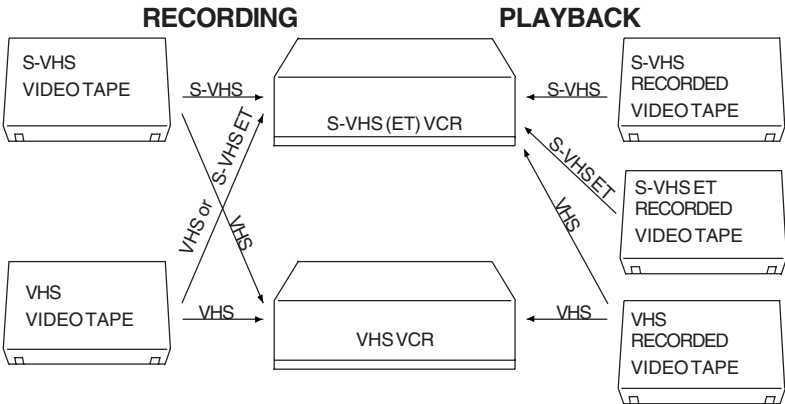
Super-VHS and VHS Tapes

- Both S (Super)-VHS and VHS recordings can be made on an S-VHS tape.
- When an S-VHS tape is inserted, the S-VHS ET will not work.
- Select “S-VHS ET ON” when recording on an HG-VHS tape in S-VHS ET mode.
- Both S-VHS ET and VHS recordings can be made on a VHS tape.
- Tapes recorded in VHS may be played back on either an S-VHS or VHS type VCR.
- Tapes recorded in S-VHS (S-VHS ET) cannot be played back on a conventional VHS VCR.

Quality Record Settings	Cassette Tape		
	SUPER VHS	HG-VHS	VHS
S-VHSET : OFF	S-VHS	VHS	VHS
S-VHSET : ON	S-VHS	S-VHS ET	*S-VHS ET
S-VHSMODE : OFF	VHS	VHS	VHS

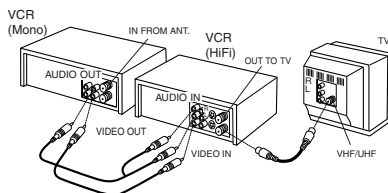
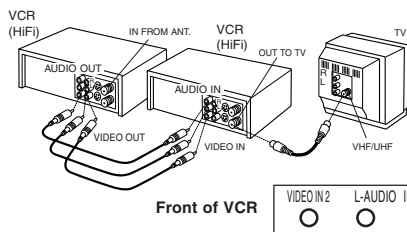
* It is not recommend to do an S-VHS ET recording on a VHS tape.

Compatibility



Copying Your Tapes (Dubbing)

Connection



(Audio/Video In Terminals on the front of VCR are available)

- ① Connect VIDEO OUT terminal on Playing VCR to VIDEO IN terminal on Recording VCR. To monitor the dubbing, also connect a TV as shown.
- ② Connect "L" and "R" AUDIO OUT terminals on Playing VCR to "L" and "R" AUDIO IN terminals on Recording VCR.

In place of a Playing VCR, you can use other equipment, such as a Camcorder. Simply connect the unit's Audio/Video outputs to the Recording VCR.

Playing (Source) VCR

Recording (Editing) VCR

1 Insert pre-recorded tape.

Insert blank tape with record tab.

2 _____

Press INPUT to set VCR Input mode to LINE1 for Video Input (Rear) or to LINE2 for Video Input (Front). (See "Selecting the Input Mode" below.)

3 Press PLAY, then PAUSE/SLOW immediately to enter PLAY/PAUSE mode.

Press REC, then PAUSE/SLOW immediately to enter REC/PAUSE mode.

The operation of steps 4 and 5 must be done on both playing and recording VCRs at the same time.

4 Press PLAY to start dubbing. Playing VCR starts playback.

Press PAUSE/SLOW to start dubbing. Recording VCR starts recording.

5 Press STOP to stop dubbing.

Press STOP to stop dubbing.

■ To Monitor Dubbing on Your TV

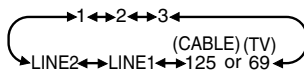
- 1 Turn your TV on and tune to the Recording VCR channel (CH3 or CH4).
- 2 Set the VCR/ TV Selector on the Recording VCR to "VCR."

Note

- Dubbing tapes protected with Copy Guard will have poor quality results.

■ Selecting the Input Mode

- Method 1: Press INPUT repeatedly.
Channel Number <--> LINE1 <--> LINE2
- Method 2: Press CH ▲/▼. Display will change as below.



- "L1" or "L2" lights up on Multi-Function Display (about 4 sec.) when LINE1 or LINE2 is selected.
- LINE1: For rear audio/video connection.
- LINE2: For front audio/video connection.

Caution: Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.

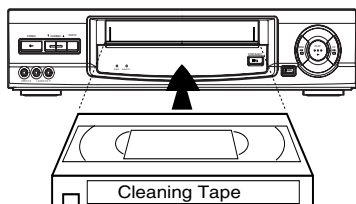
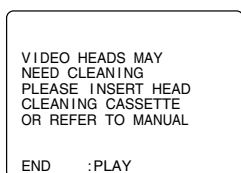
VCR & Cassette Information

Head Cleaning

Playing older or damaged tapes may eventually cause video heads to become clogged.

Video Head Clog Sensor

During playback, this screen appears if clogging is detected. To remove screen, press PLAY on the remote or VCR.



- Use “dry” type head cleaning cassette only. (Part No. NV-TCL30PT is recommended.)
- Follow cleaning tape instructions carefully. Excessive use of tape can shorten head life.
- If head clog symptoms persist, contact your nearest Factory Service Center or authorized Service Center. (See page 50.)

Cleaning the VCR

Use a soft cloth or dusting attachment of a vacuum cleaner to remove dust from the ventilation holes on the back sides and bottom of the cabinet.

Plastic surfaces are easily scratched and can be marred by alcohol and various solvents. Avoid excessive use of oil-based furniture polishes since the materials used in the cabinet will accumulate more dust. We recommend using a nonabrasive, antistatic cleaner and polisher.

VCR & Cassette Information (continued)

Specifications

Power Source:	120 V AC, 60 Hz
Power Consumption:	<u>Power On</u> Approx. 28 watts <u>Power Off</u> Approx. 3.7 watts
Video Signal:	EIA Standard NTSC color
Video Recording System:	4 rotary heads helical scanning system
Audio Track:	1 track (Normal) 2 channel (Hi-Fi Audio Sound)
Tuner:	
Broadcast Channels:	VHF 2 ~ 13, UHF 14 ~ 69
CABLE Channels:	Midband A through I (14 ~ 22), Superband J through W (23 ~ 36) Hyperband AA ~ EEE (37 ~ 64), Lowband A-5 ~ A-1 (95 ~ 99) Special CABLE channel 5 A (01), Ultraband 65~94, 100 ~ 125
S-VIDEO	
Input/Output Level:	S-VIDEO CONNECTOR (SEPARATED YC CONNECTOR) Y CONNECTOR 1.0 Vp-p. (75 ohm unbalanced) C CONNECTOR 0.286 Vp-p. (75 ohm unbalanced)
Operating Temperature:	5 °C ~ 40 °C (41 °F ~ 104 °F)
Operating Humidity:	10 % ~ 75 %
Weight:	3.5 kg (7.7 lbs).
Dimensions:	430 (W) x 98 (H) x 242 (D) mm 16-15/16" (W) x 3-7/8" (H) x 9-9/16" (D)

Note: Designs and specifications are subject to change without notice.

Features for a Quality Picture

Digital Auto Picture

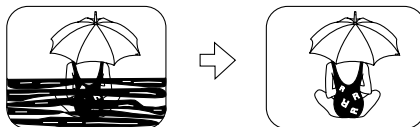
Automatically controls the video output signal for less noise depending on the tape condition.

Digital Auto Tracking

Continuously analyzes the signal and adjusts for optimum picture quality.

Manual Tracking Control (to reduce picture noise)

Use during Playback and Slow Motion mode to reduce picture noise. Press CH (TRACKING) ▲ / ▼ buttons on the remote control or on the VCR until the picture clears up. To return to Auto Tracking, press POWER off, then on again a few seconds later.



V-Lock Control (to reduce picture jitter)

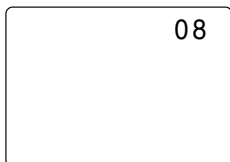
In Still mode, CH (TRACKING) ▲ / ▼ buttons operate as a V-Lock control.

CNR (Color Noise Reduction)/ANR (Advanced Noise Reduction)

Color Noise Reduction reduces the color noise. Advanced Noise Reduction reduces the luminance noise.

On-Screen Displays (OSD)

Function & Channel Display

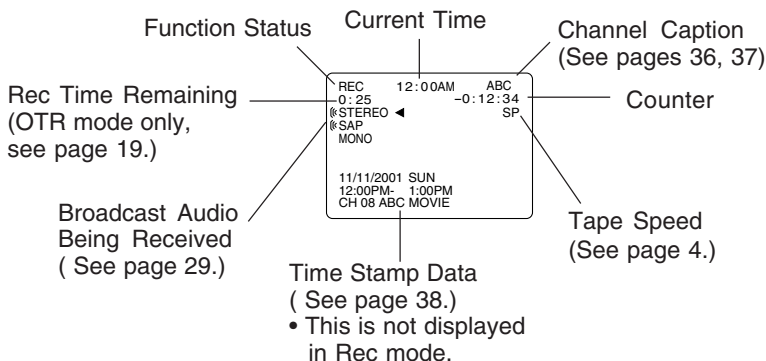


When a function button is pressed, e.g. PLAY, or you change channels, a few second display appears first in large and then small characters.

VCR Status & Clock Display

To display or remove overlay below,

--> press DISPLAY.



Blank Tape/ No Video Signal Indication

Whenever a blank section of a tape comes up in Play mode, or when the selected channel has no broadcast signal with the Weak Signal Display Feature (page 41) set to OFF, the TV screen will turn solid blue.

On-Screen Displays (continued)

Warning and Instruction Displays

These displays will alert you to a missed operation or provide further instructions.

OSD	Caution	Pg	OSD	Caution	Pg
NO CH FOUND PLEASE CHECK ANTENNA CABLE CONNECTION THEN PRESS CH UP KEY AGAIN	If no active channels are found for CHANNEL MEMORY...	10 12	TO CANCEL TIMER REC PRESS POWER THEN STOP KEY	If you press POWER or STOP during a Timer Recording... (visible in VCR mode only)	21
PLEASE SET CLOCK BY PRESSING ACTION KEY	If you attempt to set or review a Timer Recording and the Clock is not set...	20	VIDEO HEADS MAY NEED CLEANING PLEASE INSERT HEAD CLEANING CASSETTE OR REFER TO MANUAL END :PLAY	If head cleaning becomes necessary while playing back a tape...	45
TURN VCR OFF FOR TIMER RECORDING	After a Timer Program has been set...	20	VCR LOCK ACTIVATED	If you press a function button other than STOP/EJECT or POWER while the VCR is in VCR Lock mode...	40
CHECK CASSETTE RECORD TAB	If you press REC on the remote control or VCR, and a cassette is inserted with no record tab...	4	REMOTE CONTROL IS SET TO CABLE/DSS MODE USE VCR : VCR KEY USE TV : TV KEY	If you press an invalid key on the remote while in CABLE/DSS mode...	26 27 41
NO CASSETTE PLEASE INSERT A CASSETTE	If you press PLAY, FF, REW, or REC on the remote control or VCR without a cassette inserted...	18 19	REMOTE CONTROL IS SET TO TV MODE USE VCR : VCR KEY USE CABLE/DSS : CABLE/DSS	If you press an invalid key on the remote while in TV mode...	26 27 41

Before Requesting Service

Check the following points once again if you are having trouble with your VCR.

Power	Correction
No power...	• Completely insert Power Plug into an AC outlet. • Set POWER button to on. • Make sure power source is active.
Recording & Playback	Correction
TV program cannot be recorded...	• Check connections between VCR, external antenna, and TV. • Check connections selection. (P.10,12,28) • Make sure your antenna system (CABLE or TV) is correctly set. (Channels [P.16]) • Make sure cassette record tab is intact. (P.4)
Timer recording cannot be performed...	• Confirm that clock is set to current time and date. • Make sure Cable/DSS box (if used) is left on and tuned to channel to be recorded. • Set recording start/stop times correctly. (P.20) • Make sure VCR POWER button is pressed off. (P.20) • Timer recording may not be performed or continued if a power interruption occurs before or during a Timer Recording, even after power is restored.
There is no playback picture, or the playback picture is noisy or contains streaks...	• Select channel 3 or 4 on TV to match VCR output channel (3 or 4) (P.10) or select LINE. • Set VCR/TV selector to "VCR." • Adjust TRACKING control in either direction. (P.46) • Try Head Cleaning. (P.45)
Special effects playback, picture may contain some vertical jitter when using a TV with an Automatic Vertical Hold Control...	• Set TV's Vertical Hold Control to MANUAL, then adjust.
VCR cannot be controlled...	• Make sure VCR power is on. • Check Remote batteries. • Make sure VCR LOCK is set to off. (P.40) • Make sure Remote is in proper mode. (P.26) • Make sure Timer Record is not in progress.
Remote Control	Correction
VCR cannot be remote controlled...	• Make sure VCR power is on. • Make sure Remote is in VCR mode. • Aim Remote Control directly at remote sensor on VCR. (P.6) • Avoid any object blocking signal path. • Check Remote batteries. (P.4) • Make sure VCR LOCK is set to off. (P.40) • Exposing VCR remote sensor to direct fluorescent or outdoor light may cause signal interference.
ACTION and PROG/VCR+ buttons do not respond...	• Check connections between VCR, external antenna, and TV. • Press VCR button for VCR mode. (P.26) • Check Remote batteries. (P.4)
Miscellaneous	Correction
Programs cannot be viewed on TV...	• Make sure TV power is on. • Make sure TV is set to output of VCR. • Check connections between VCR, external antenna, and TV. • Set VCR/TV selector to "TV." (P.19) • Make sure proper signal source is selected.
Video cassette cannot be inserted...	• Insert the cassette with window side up; record tab facing you. • Check if a tape is already in the unit.
Video cassette cannot be removed...	• Completely insert Power Plug into an AC outlet.
Video cassette ejects when a recording is started or the power is turned off for timer recording...	• Make sure cassette record tab is intact. (P.4)
In Stop mode, the motor (CYLINDER) continues to rotate...	• To enable Quick play mechanism, the cylinder will rotate for about 3 minutes. This reduces response time from Stop to Play mode and from Play to Rewind Search mode.

If you cannot resolve the problem, please call the Customer Call Center for product assistance at 1-800-211-PANA (7262).

To locate an authorized servicer, please call toll free 1-800-211-PANA (7262).
or send e-mail to : consumerproducts@panasonic.com

Service Center List

For Product Information, Operating Assistance, Literature Request, Dealer Locations, and all Customer Service inquiries please contact:

1-800-211-PANA (7262), Monday-Friday 9am-9pm Saturday-Sunday 9am-7pm, EST. or send e-mail to : consumerproducts@panasonic.com

Web Site: <http://www.panasonic.com>

You can purchase parts, accessories or locate your nearest servicenter by visiting our Web Site.

Accessory Purchases:

Customer Orders Only 800-332-5368 (Customer Orders Only)
Panasonic Services Company 20421 84th Avenue South, Kent, WA 98032
(6 am to 5 pm Monday - Friday; 6 am to 10:30 am Saturday; PST)
(Visa, MasterCard, Discover Card, American Express, Check)

Factory Servicenters Locations

CALIFORNIA

6550 Katella Avenue
Cypress, CA 90630

800 Dubuque Avenue
S. San Francisco,
CA 94080

3878 Ruffin Road
Suite A
San Diego, CA 92123

COLORADO

1640 South Abilene
Street Suite D
Aurora, CO 80012

FLORIDA

3700 North 29th
Avenue
Suite 102
Hollywood, FL
33020

GEORGIA

8655 Roswell Road
Suite 100
Atlanta, GA 30350

ILLINOIS

9060 Golf Road
Niles, IL 60714

1703 North Randall
Road
Elgin, IL 60123
(Pick-up/Drop-off only)

MARYLAND

62 Mountain Road
Glen Burnie, MD
21061

MASSACHUSETTS

60 Glacier Drive
Suite G
Westwood, MA 02090

MINNESOTA

7850-12th Avenue
South
Airport Business Center
Bloomington, MN 55425

OHIO

2236 Waycross Road
Civic Center Plaza
Forest Park, OH 45240

PENNSYLVANIA

2221 Cabot Blvd. West
Suite B
Langhorne, PA 19047

TEXAS

13615 Welch Road
Suite 101
Farmers Branch,
TX 75244

WASHINGTON

20425-84th Avenue
South
Kent, WA 98032

HAWAII

99-859 Iwaiwa
Street
Aiea, Hawaii 96701
Phone (808)488-
1996
Fax (808)486-4369

Service in Puerto Rico

Matsushita Electric of Puerto Rico, Inc. Panasonic Sales Company/ Factory Servicenter:
Ave. 65 de Infanteria, Km. 9.5, San Gabriel Industrial Park, Carolina, Puerto Rico 00985
Phone (787)750-4300 Fax (787)768-2910

As of January 2000

Limited Warranty

Panasonic Consumer Electronics Company,
Division of Matsushita Electric Corporation
of America, One Panasonic Way
Secaucus, New Jersey 07094

Panasonic Sales Company,
Division of Matsushita Electric of Puerto Rico, Inc.
AVE. 65 de Infantería, Km. 9.5 San Gabriel
Industrial Park Carolina, Puerto Rico 00985

PANASONIC Video Products Limited Warranty

Panasonic Consumer Electronics Company or Panasonic Sales Company (collectively referred to as "the Warrantor") will repair this product with new or refurbished parts, free of charge, in the USA or Puerto Rico, in the event of a defect in materials or workmanship as follows (all time periods commence from the date of the original purchase):

PRODUCT	PARTS	LABOR	SERVICE	CONTACT NUMBER
CAMCORDER	ONE (1) YEAR, EXCEPT CCD IMAGE SENSOR CCD IMAGE SENSOR - SIX (6) MONTHS	NINETY (90) DAYS NINETY (90) DAYS	Carry-In or Mail In	1-800-211-PANA(7262)
VCR	ONE (1) YEAR	NINETY (90) DAYS	Carry-In or Mail In	1-800-211-PANA(7262)
A/V MIXER	ONE (1) YEAR	NINETY (90) DAYS	Carry-In or Mail In	1-800-211-PANA(7262)
MONITOR- VCR Combination	ONE (1) YEAR, EXCEPT CRT CRT - TWO (2) YEARS	NINETY (90) DAYS CRT - NINETY (90) DAYS	Carry-In: 21" CRT and Smaller In-home or carry-in: 22" CRT and Larger	1-800-211-PANA(7262)

Batteries (if included) - New rechargeable batteries in exchange for defective rechargeable batteries for ten (10) days. Non-rechargeable batteries are not warranted.

Tape (if included) - New video cassette tape in exchange for a defective video cassette tape for five (5) days. In-home, carry-in or mail-in service, as applicable, in the USA can be obtained during the warranty period by contacting a Panasonic Services Company (PASC) Factory Servicenter listed in the Service Directory. Or call toll free contact number listed above, to locate an authorized PASC Servicenter. Carry-in or mail-in service in Puerto Rico can be obtained during the warranty period by calling the Panasonic Sales Company telephone number listed in the Servicenter Directory. This warranty is extended only to the original purchaser. A purchase receipt or other proof of the date of the original purchase is required before warranty service is rendered.

This warranty only covers failures due to defects in materials and workmanship which occur during normal use and does not cover normal maintenance, including, but not limited to, video and audio head cleaning. The warranty does not cover damage which occurs in shipment, or failures which are caused by products not supplied by the warrantor, or failures which result from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, modification, faulty installation, set-up adjustments, improper antenna, inadequate signal pickup, maladjustment of consumer controls, improper operation, power line surge, improper voltage supply, lightning damage, commercial use such as hotel, office, restaurant, or other business or rental use of the product, or service by anyone other than a PASC Factory Servicenter or a PASC authorized Servicenter, or damage that is attributable to acts of God.

LIMITS AND EXCLUSIONS

There are no express warranties except as listed above. THE WARRANTOR SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGE TO RECORDING MEDIA) RESULTING FROM THE USE OF THIS PRODUCTS, OR ARISING OUT OF ANY BREACH OF THE WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. If a problem with this product develops during or after the warranty period, you may contact your dealer or Servicenter. If the problem is not handled to your satisfaction, then write to the Consumer Affairs Department at the Panasonic Consumer Electronics Company address above. SERVICE CALLS WHICH DO NOT INVOLVE DEFECTIVE MATERIALS OR WORKMANSHIP AS DETERMINED BY THE WARRANTOR, IN ITS SOLE DISCRETION, ARE NOT COVERED. COSTS OF SUCH SERVICE CALLS ARE THE RESPONSIBILITY OF THE PURCHASER. warvid 8/8/2000

For Your
Information

Spanish Quick Use Guide/ Guía para rápida consulta

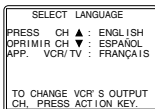
Como realizar la Configuración Inicial (VCR-TV)

1 Encienda el TV y ajústelo al canal 3.

2 Al encender el VCR con el control remoto. Al encender el VCR por primera vez, en la pantalla aparecerá SELECT LANGUAGE.

3

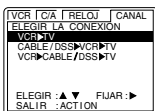
Presione CH ▲ para seleccionar Inglés.
Presione CH ▼ para seleccionar Español.
Presione VCR/TV para seleccionar Francés.



- Si la pantalla no aparece, verifique las conexiones entre el VCR y el TV, y si el TV está sintonizado al canal 3, intente cambiándolo al canal 4.
- Cuando desee cambiar el canal de salida del VCR, por favor remítase Canal de Salida del VCR en la página 17.
- Si ajusta el idioma equivocado, realice los pasos de "Reajuste de Todas las Funciones de Memoria del VCR" en la página 11.

4

Presione ▲▼ para seleccionar la conexión VCR ► TV y luego presione ► para ajustar.



5

Presione CH ▲ para comenzar la operación de Ajuste Automático Canal/Reloj.



Caso: La conexión "CABLE/DSS ► VCR ► TV"

- Encienda la caja de cable y ajuste su canal de Estación Pública de Radiodifusión (PBS) en su uso horario.
- Si utiliza un receptor DSS, este tiene que estar apagado.

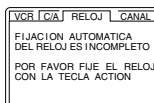
6 El ajuste Canal/Reloj se lleva a cabo automáticamente.

Caso 1
(Configuración completada)

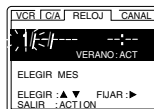


Presione CH ▲ para salir.

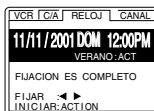
Caso 2
(Configuración incompleta)



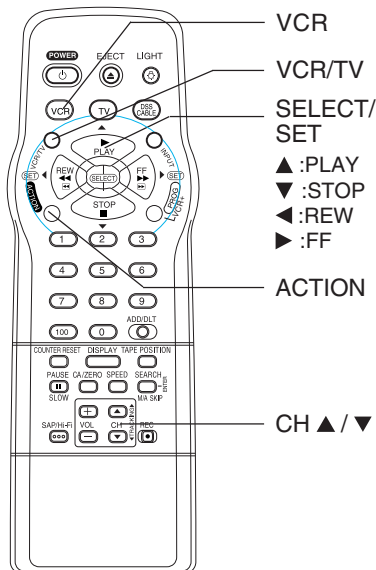
Presione ACTION para visualizar la pantalla del menú RELOJ.



Presione ▲▼ para seleccionar el mes y ► para ajustar. De la misma forma, seleccione y ajuste la fecha, año, hora y DST (Hora de Verano).



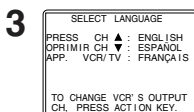
Presione dos veces ACTION para poner el RELOJ en marcha y salir.



Como realizar la Configuración Inicial (CABLE/DSS-VCR-TV)

1 Encienda el TV y ajústelo al canal 3.

2 Al encender el VCR con el control remoto. Al encender el VCR por primera vez, en la pantalla aparecerá SELECT LANGUAGE.

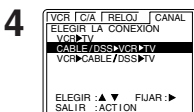


Presione **CH ▲** para seleccionar Inglés.

Presione **CH ▼** para seleccionar Español.

Presione **VCR/TV** para seleccionar Francés.

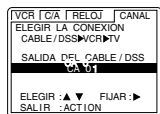
- Si la pantalla no aparece, verifique las conexiones entre el VCR y el TV, y si el TV está sintonizado al canal 3, intente cambiándolo al canal 4.
- Cuando desee cambiar el canal de salida del VCR, por favor remítase Canal de Salida del VCR en la página 17.
- Si ajusta el idioma equivocado, realice los pasos de "Reajuste de Todas las Funciones de Memoria del VCR" en la página 11.



Presione **▲▼** para seleccionar la conexión CABLE/DSS ► VCR ► TV y luego.

Presione **►** para ajustar.

5 Confirme el canal de salida de su caja de cable o receptor DSS.



Presione **▲▼** para seleccionar el canal de salida de su caja de TV por cable o receptor DSS.

Presione **►** para fijar.



Presione **▲▼** para seleccionar el número de código de la caja de TV por cable o receptor DSS. (Consulte la lista de la página 9.)

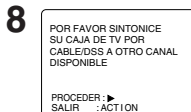
Presione **►** para fijar.

- Luego, vaya al paso 5 en la página 52.
- Si su caja de TV por cable o su receptor DSS no tiene un control remoto, elija "SIN CONTROL REMOTO"



Presione **▲▼** para seleccionar un canal disponible en su caja de TV por cable o receptor DSS.

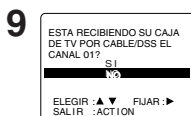
Presione **►** para fijar.



Sintonizar la TV por cable o el canal receptor DSS.

Presione **►** para fijar.

"ESTA TRANSMITIENDO" aparece.



Presione **▲▼** para elegir "SI" o "NO".

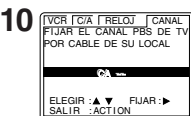
Presione **►** para fijar.

Si ud, usa una caja de TV por cable y ha elegido "SI", siga al paso 10.

Si ud, usa unreceptor DSS y ha elegido "SI", siga al paso 5 en la página 52.

Si ha elegido "NO", aparecerá de nuevo la pantalla del paso 6. Intente fijar un código diferente para su marca y/o cambie le conexión de su equipo.

Si su respuesta es todavía "NO", el control de la caja de TV por cable o el receptor DSS no es disponible.



Verifique que su caja de TV por cable esté encendido y su receptor DSS esté apagado.

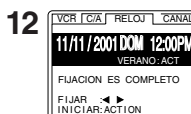
Presione **▲▼** para seleccionar el canal PBS de su local.

Presione **►** para fijar.



Presione **CH ▲** para iniciar la fijación automática del reloj.

- "FIJACION AUTOMATICA DE RELOJ EN PROCESO" aparece.



Comprobar si la hora está fijada correctamente.

Presione **CH ▲** para terminar la fijación.

Si la hora que aparece no es correcta...

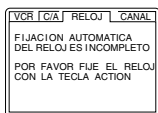
Si utiliza la caja de TV por cable y recibe más de una emisora PBS, intente nuevamente el ajuste automático del reloj donde antes no hubiera probado.

Si la hora no se puede ajustar automáticamente siga los pasos "Ajustar de nuevo el reloj" como demuestra más abajo.

Si aparece la pantalla inferior...

La instalación automática del reloj no es de aplicación para su zona horaria.

Presione ACTION para que aparezca la pantalla "Fijación Manual del Reloj" y siga las paso 6 (caso 2) de la página 52.



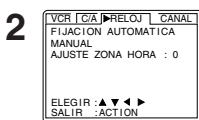
Nota

La fijación automática de la hora se efectuará cada día al apagar la videgrabadora por primera vez.

Por eso, la caja de TV por cable debe permanecer encendido y sintonizado al canal PBS cuando la videgrabadora se apaga.

Ajustar de nuevo el reloj

1 Presione ACTION para exhibir el menú.



Presione ◀▶ para seleccionar "RELOJ".



Presione ▲▼ para seleccionar "MANUAL" y luego presione ▶.



Presione ▲▼ y ▶ para seleccionar y ajustar la hora y la fecha.

5 Presione ACTION dos veces para que el reloj comience a funcionar y salir desde esté modo.

Operaciones básicas para la reproducción

1 Inserte un cassette,

- la alimentación del VCR se activa. En la Pantalla de Visualización Multi Función se ilumina "VCR".

2 Presione PLAY para reproducir el cassette.

- Si el cassette no tiene lengüeta de prevención de grabación (página 4), se inicia la reproducción automáticamente.

Detalles especiales durante la grabación

■ Presione FF o REW para búsqueda de escenas hacia delante/ hacia atrás. Presione de nuevo o presione PLAY para liberar.

■ Presione PAUSE/SLOW para imagen Fija (Congelada). Presione PLAY para liberar.

■ Presione PAUSE/SLOW en el modo de Imagen fija para imágenes cuadro a cuadro. Presione PLAY para liberar.

■ Mantenga presionado PAUSE/SLOW en el modo de imagen fija para imágenes en cámara lenta. Presione PLAY para liberar.

3 Presione STOP para detener el cassette.

■ Presione REW o FF en el modo de parada para rebobinado/avance rápido del cassette.

■ Presione EJECT en el control remoto, o STOP/EJECT en el VCR para expulsar el cassette.

Operaciones básicas para la grabación

- 1 **Inserte el cassette con lengüeta de protección de grabación (pág. 4).**
 - La alimentación del VCR se activa. En la pantalla Multi Función se ilumina "VCR".
- 2 **Presione CH ▲▼, o las teclas de números para seleccionar el canal.**

- 3 **Presione SPEED para seleccionar la velocidad de grabación (pág.4)**

- SP = Reproducción estándar,
- LP = Larga duración,
- SLP = Superlarga duración.

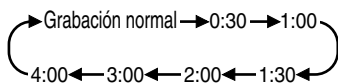
- 4 **Presione REC para comenzar a grabar.**

- Para eliminar escenas indeseadas, presione PAUSE/SLOW para pausar, y al presionar nuevamente se reanuda la grabación.
- No podrá ver otro canal durante la grabación.

- 5 **Presione STOP para detener la grabación.**

■ Grabación de un toque (grabar en marcha),

- El VCR se apaga después de ajustar la extensión de la grabación.
- > Cada vez que se presiona REC se añaden 30 min. a la extensión de grabación hasta un máximo de 4 horas.

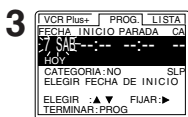


Programación fácil para la grabación con temporizador

- 1 **Presione PROG/VCR+** para visualizar PROGRAM.



Presione ◀▶ para visualizar la pantalla de Programación.



- 1) **Para ajustar la FECHA de grabación,**

presione ▲▼ para seleccionar:

1-31 = una vez, o
DIARIO = a la misma hora de lunes a viernes, o
SEMANA = a la misma hora cada semana y
presione ▶ para ajustar.

Orden para elegir

Ejemplo

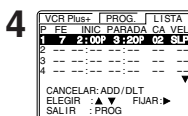


- 2) **Para ajustar los ítems que quedan,**

presione ▲▼ para seleccionar y

presione ▶ para ajustar los tiempos de INICIO/PARADA, CANAL, o entrada de LÍNEA (pág. 44), CATEGORIA*, y velocidad de el cassette (SP, LP, SLP).

* Categoría
NO, DEPORTE, CINE, COMEDIA, MUSICA, DRAMA



Presione ▲▼ para seleccionar un número que no está usando para ingresar mas programas y **presione ▶** para ajustar. Luego repita el paso 3.
Presione nuevamente PROG/VCR+ para salir.

- 5 **Presione POWER off** para ajustar el temporizador.

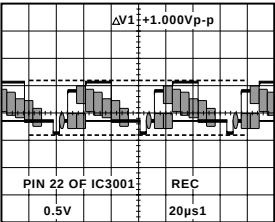
(Se ilumina "TIMER" en el panel delantero)

Index

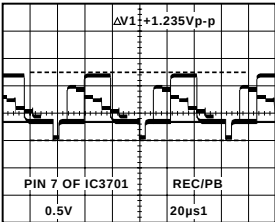
A		P	
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Add or Delete a Channel	17	Power Button	6
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NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.

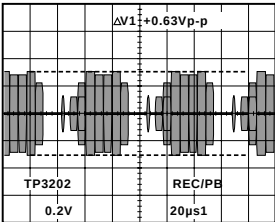
MAIN C.B.A.



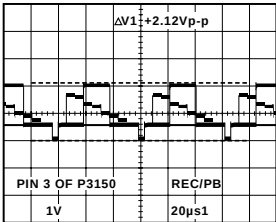
WF1



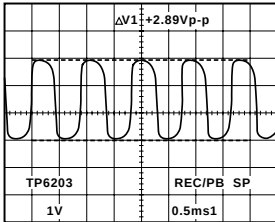
WF6



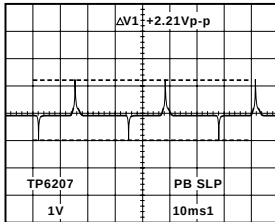
WF11



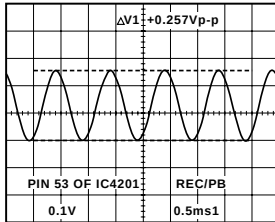
WF16



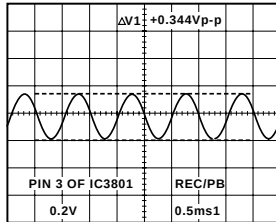
WF21



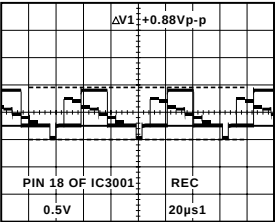
WF24



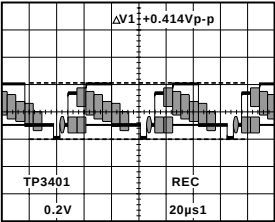
WF29



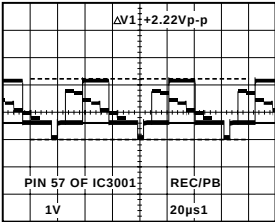
WF35



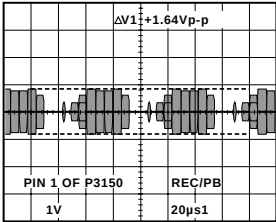
WF2



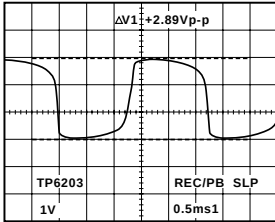
WF7



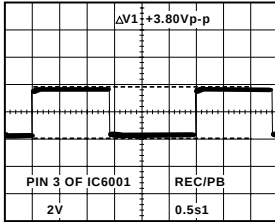
WF12



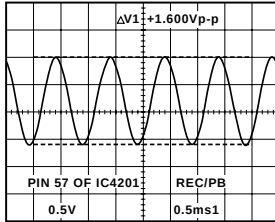
WF17



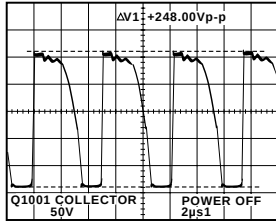
WF21



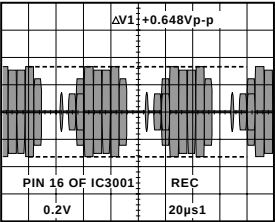
WF25



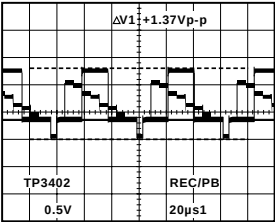
WF30



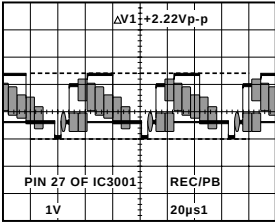
WF40



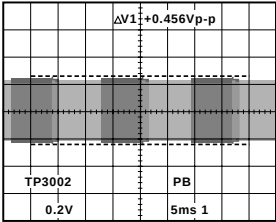
WF3



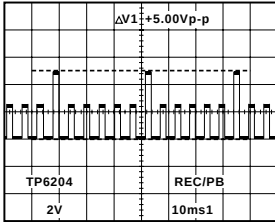
WF8



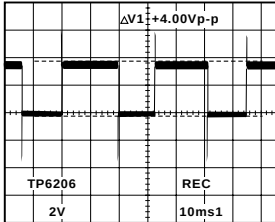
WF13



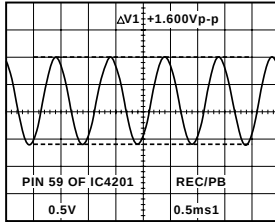
WF18



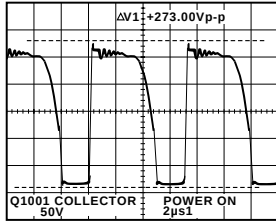
WF22



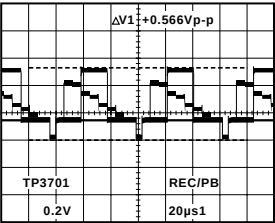
WF26



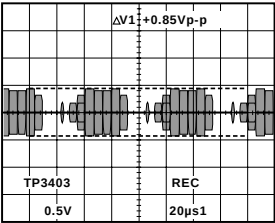
WF31



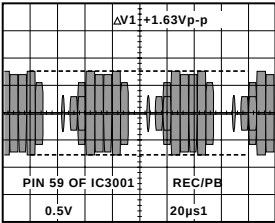
WF40



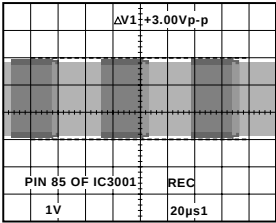
WF4



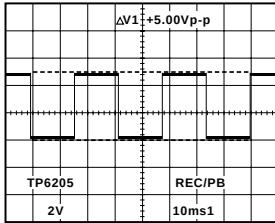
WF9



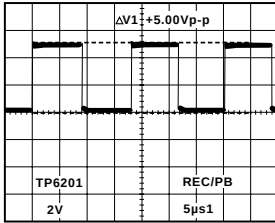
WF14



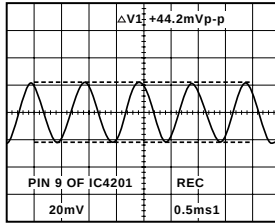
WF19



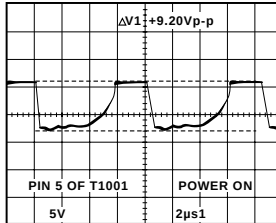
WF23



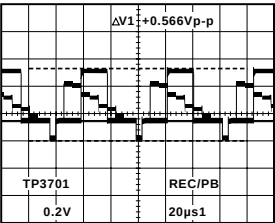
WF27



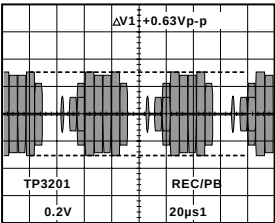
WF32



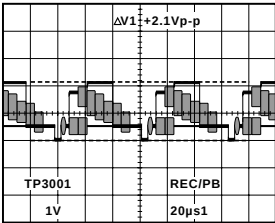
WF41



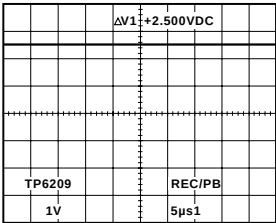
WF5



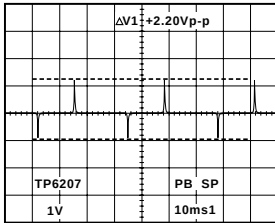
WF10



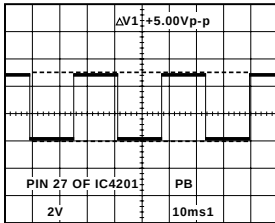
WF15



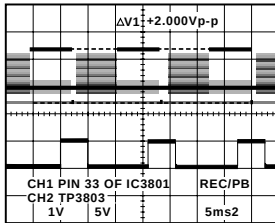
WF20



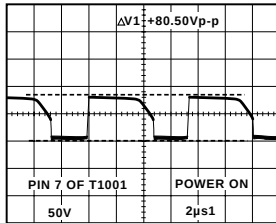
WF24



WF28

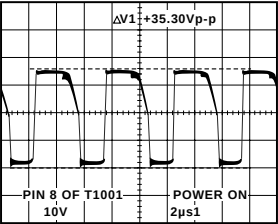


CH1 WF33
CH2 WF34

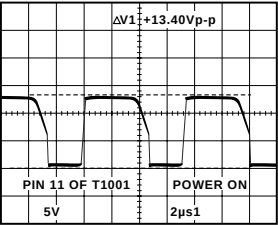


WF42

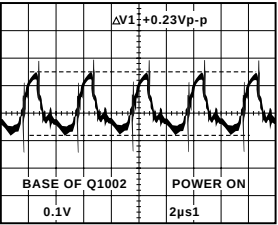
NOTE:
FOR SCHEMATIC DIAGRAM AND CIRCUIT BOARD LAYOUT NOTES,
REFER TO BEGINNING OF SCHEMATIC SECTION.



WF43

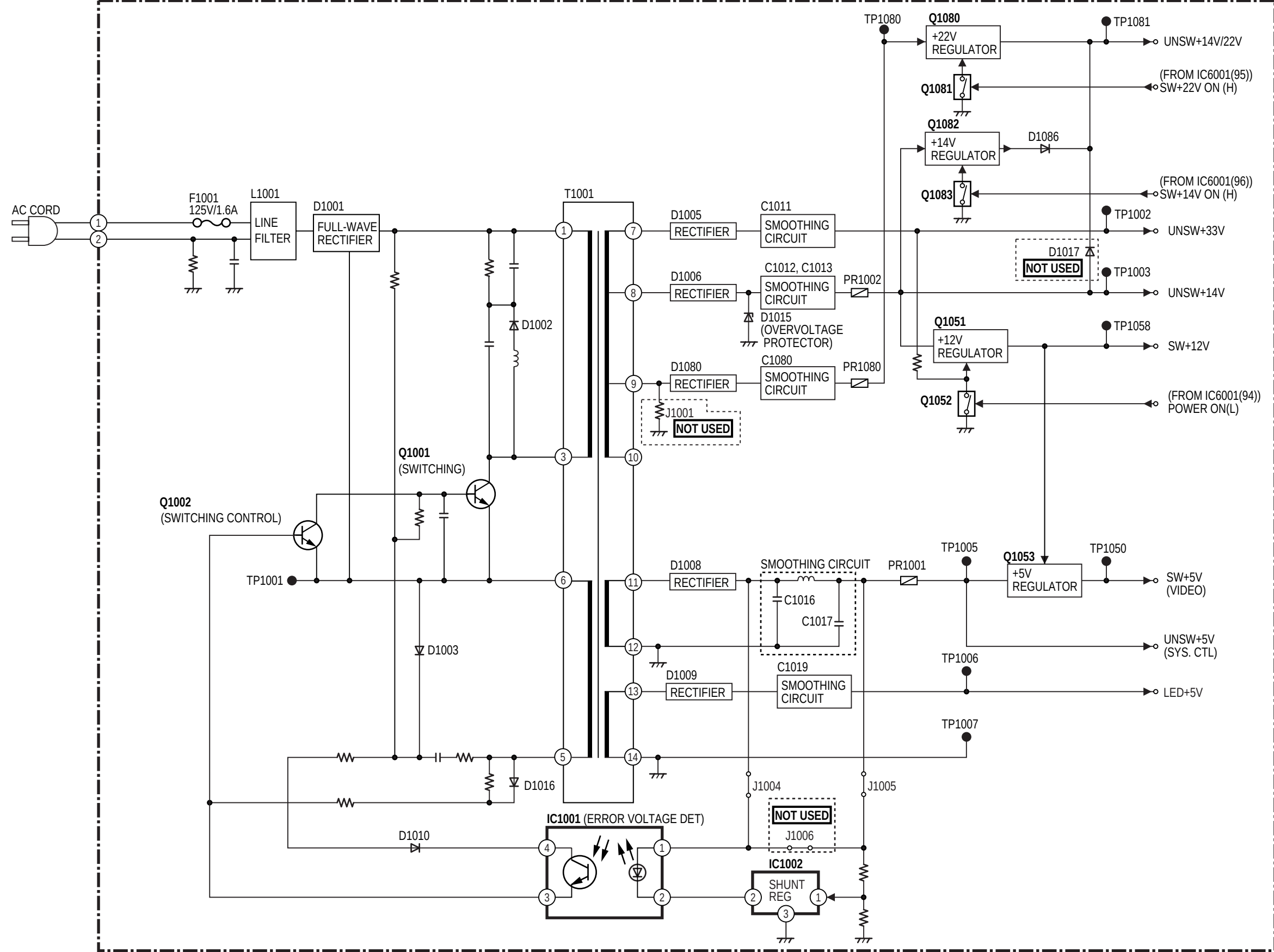


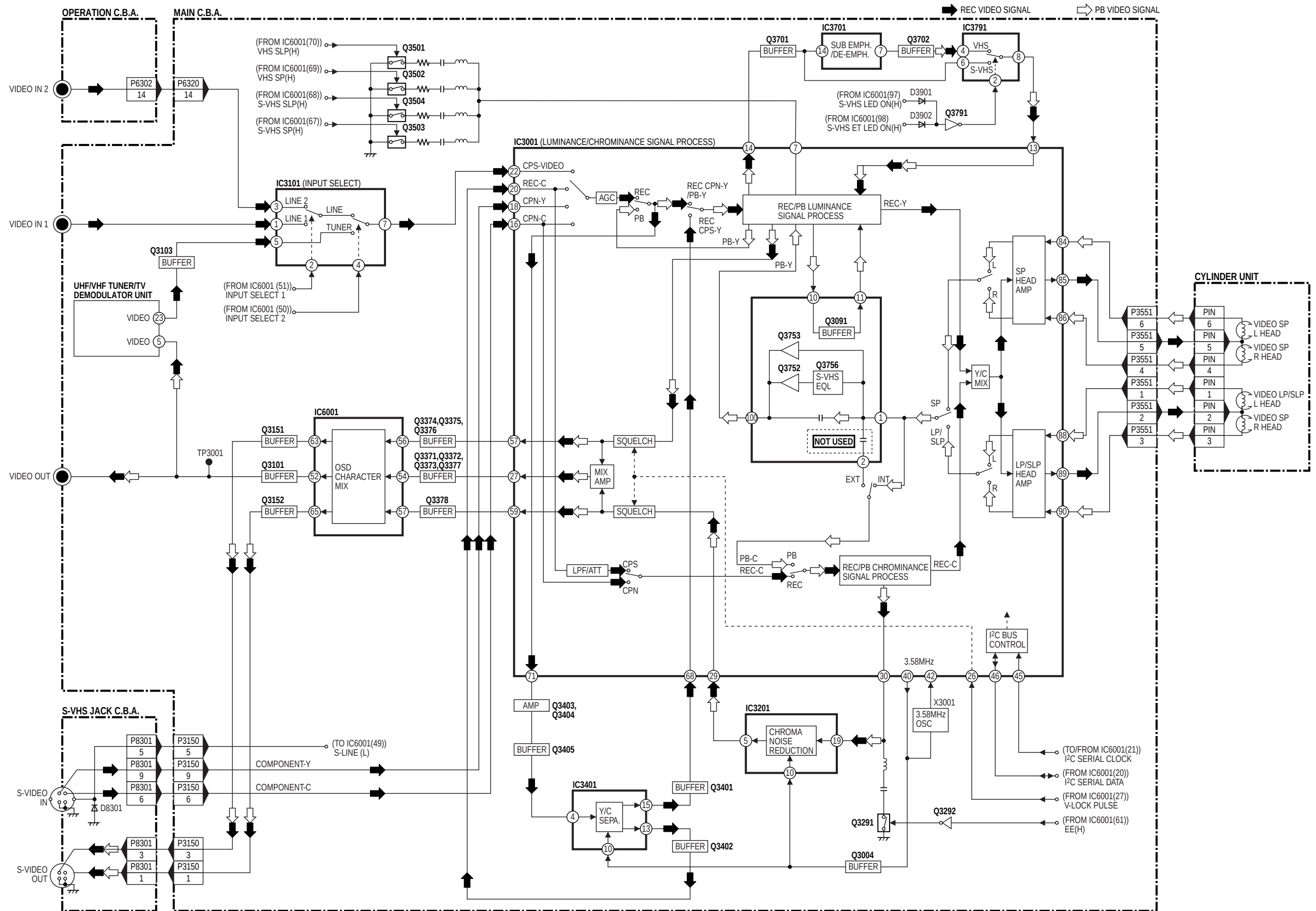
WF44



WF45

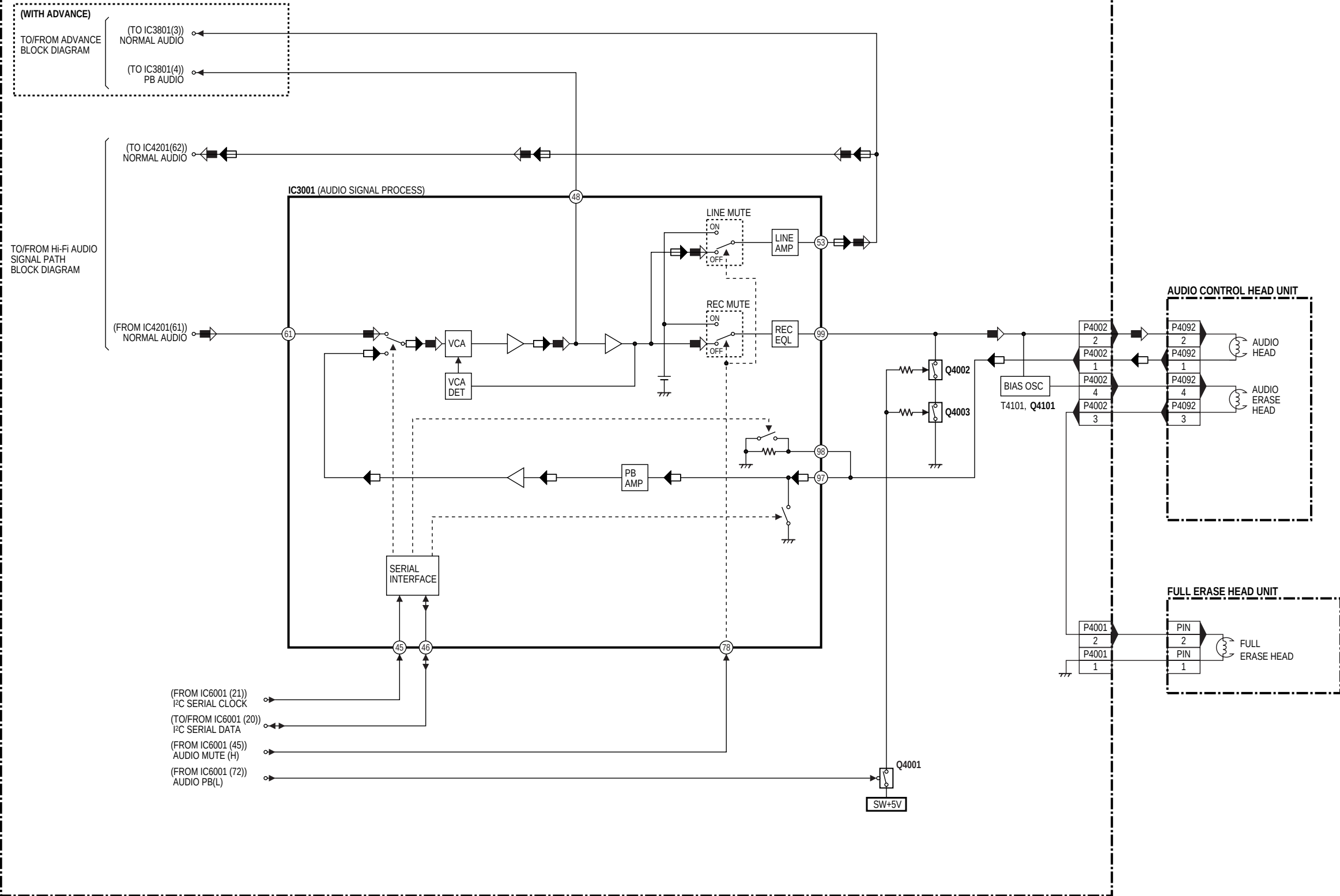
MAIN C.B.A.

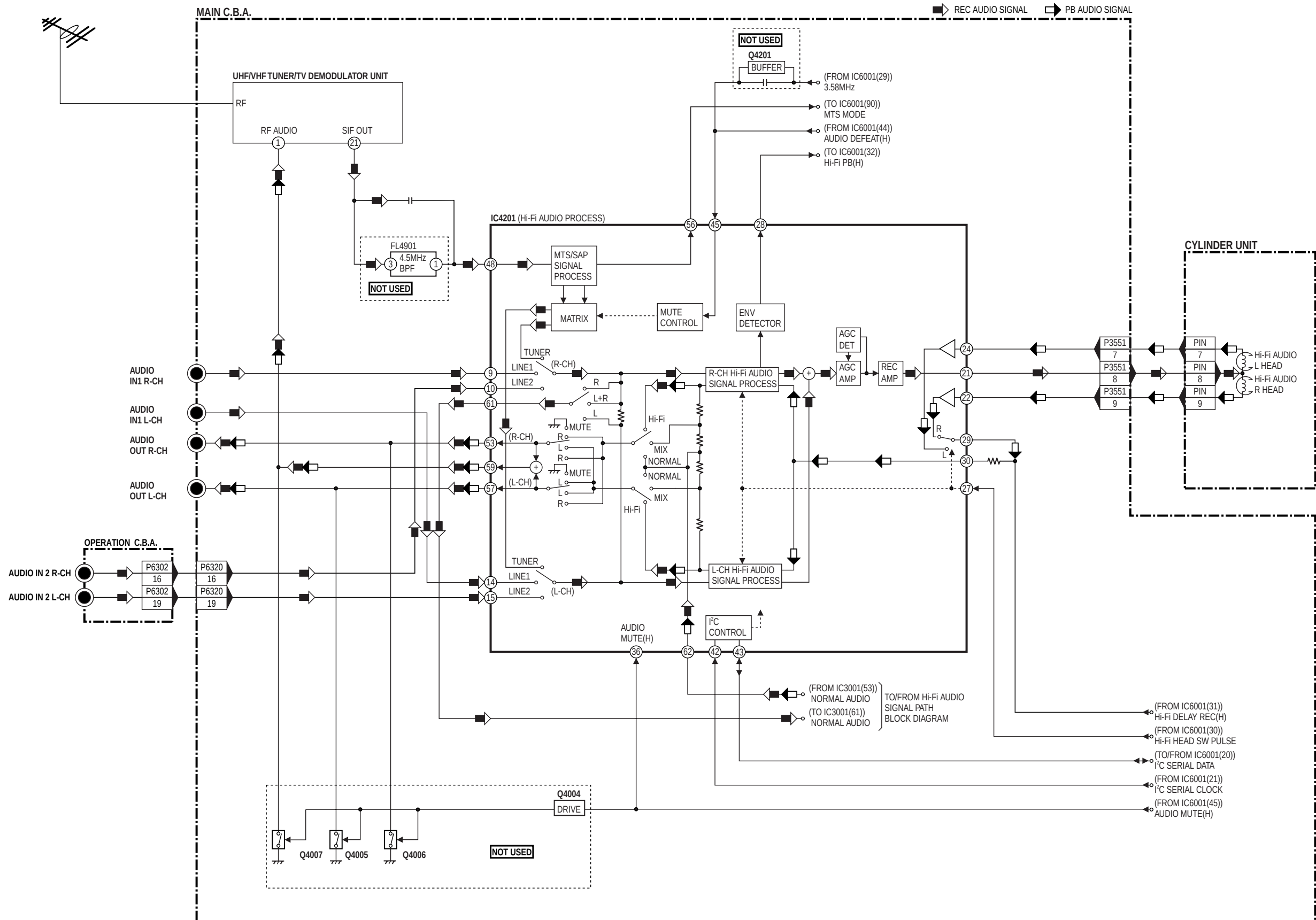


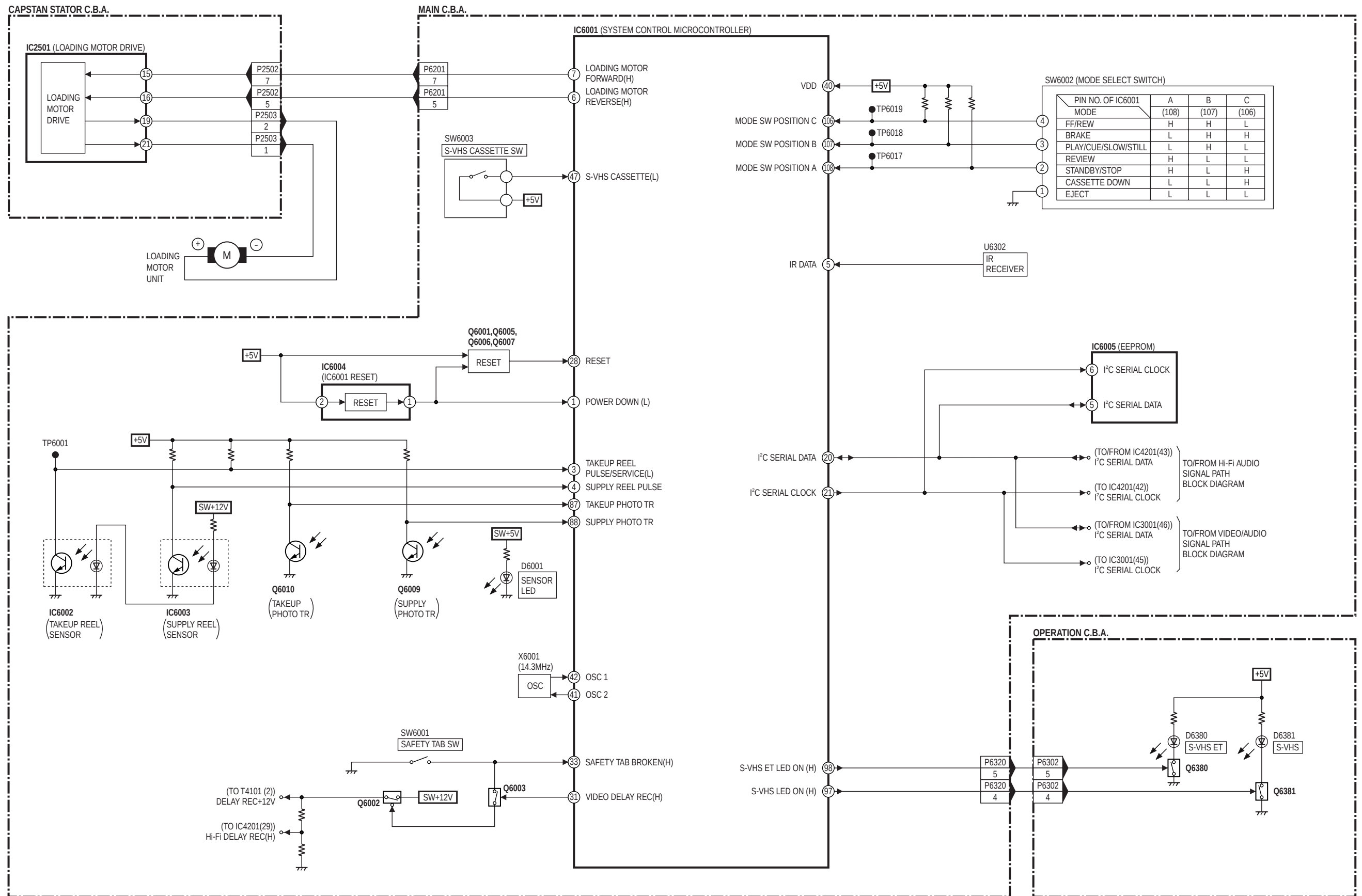


MAIN C.B.A.

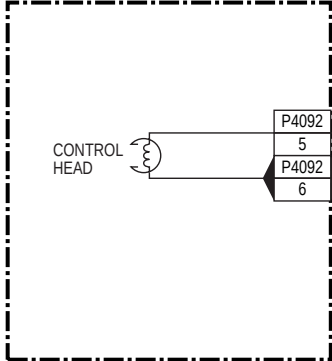
REC AUDIO SIGNAL PB AUDIO SIGNAL



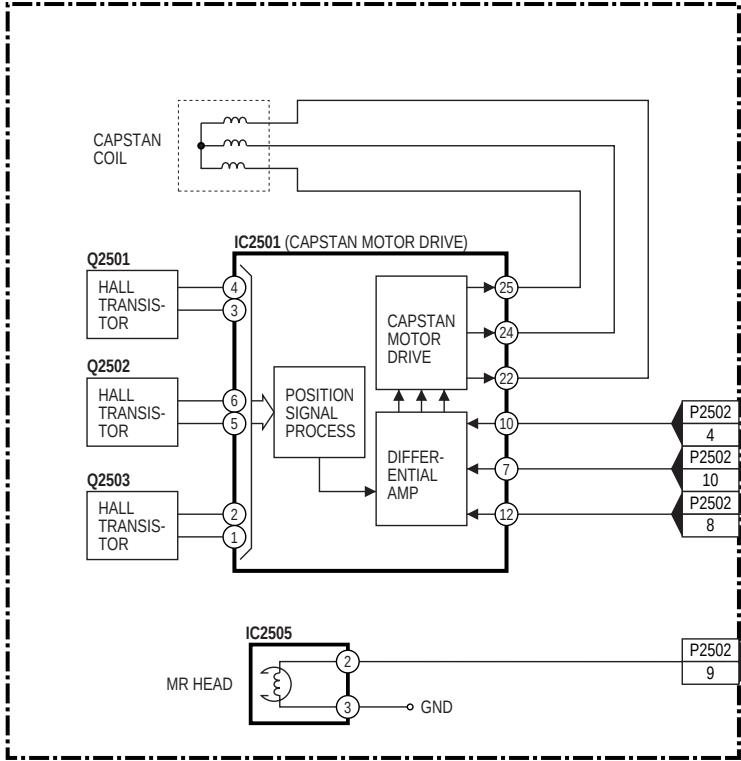




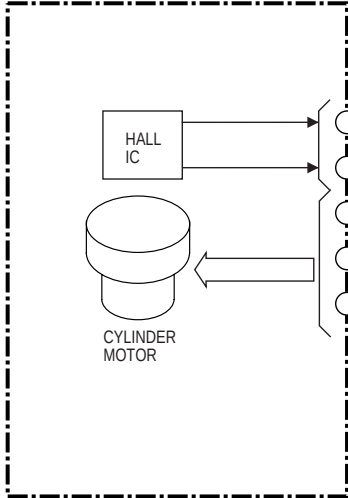
AUDIO CONTROL HEAD UNIT



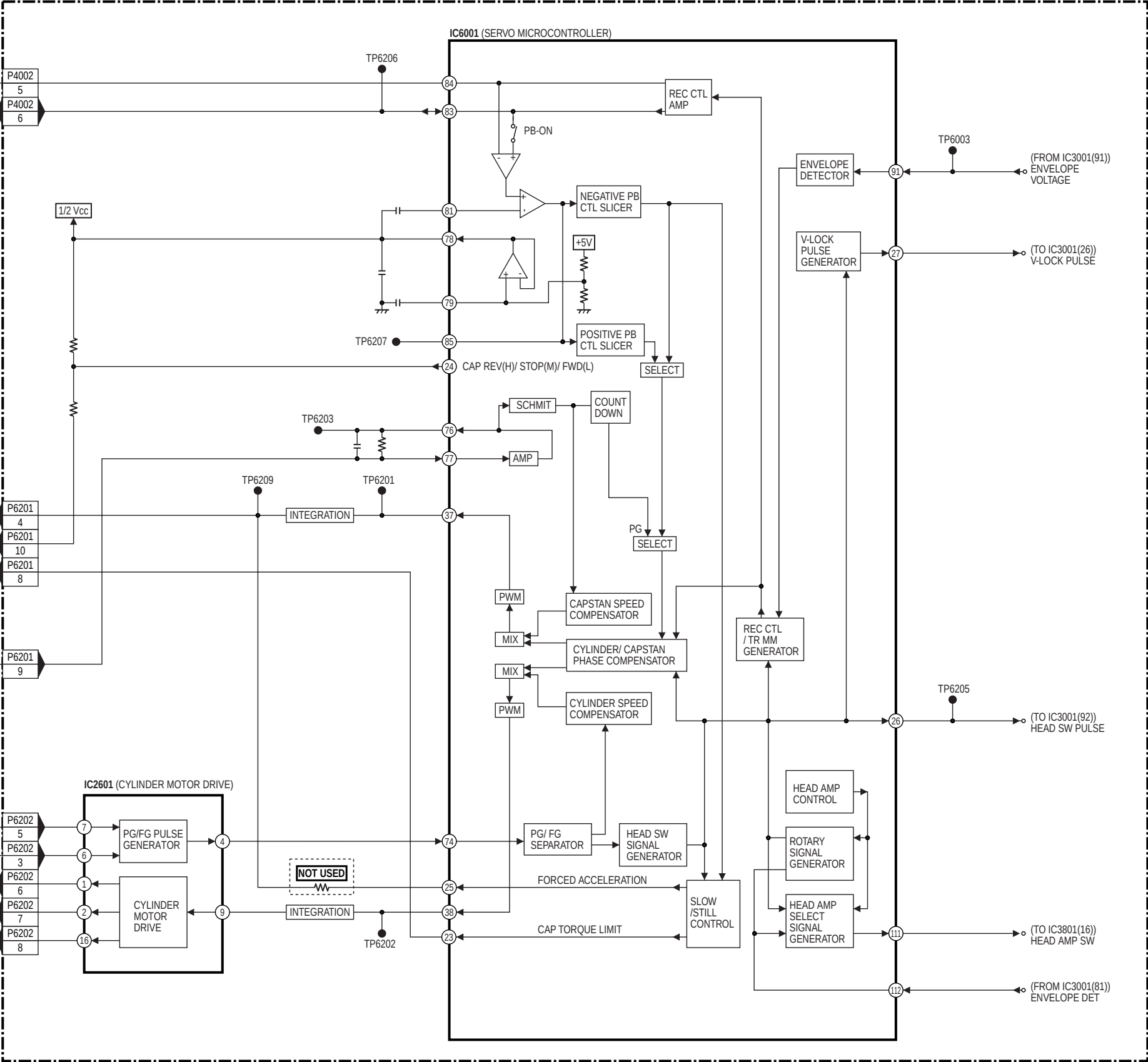
CAPSTAN STATOR C.B.A.



CYLINDER UNIT



MAIN C.B.A.



IC6401 (CATV CONTROL)

CATV CS (L) (15) ← P6302 (6)

CATV DATA (16) ← P6302 (7)

CATV SCK (3) ← P6302 (8)

IR CODE (8) → Q6401 → D6403 (INFRARED LED) → D6402 (INFRARED LED) → D6401 (INFRARED LED) → +14V

VDD (9) ← +5V

RESET (13) ← IC6403 (RESET) ← IC6402 (RESET) ← NOT USED

X IN (11) ← X6401 (4MHz) OSC

X OUT (10) → X6401 (4MHz) OSC

IC6001 (SYSTEM CONTROL MICROCONTROLLER)

IC6301 (INDICATOR PANEL CONTROL)

OUT

OUT IN	SCAN 1 PIN 104	SCAN 2 PIN 105
DATA 8 PIN 102	—	REC /TIME
DATA 9 PIN 8	—	REW
DATA 10 PIN 9	—	FF
DATA 11 PIN 10	CH DOWN	POWER
DATA 12 PIN 11	VCR/TV	CH UP
DATA 13 PIN 12	STOP /EJECT	PLAY

IN

GRID

DISPLAY TUBE

FIP

SEGMENT